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Introduction

The goal of this project is to create a functioning laboratory at the University of South Carolina whose purpose was to conduct research on central nervous system mechanisms (with fMRI and HD-ERPs) involved in deceptive behavior. The most intensive part of the project was the construction of an fMRI facility within the Palmetto Health Hospital, and training for faculty and staff at the University of South Carolina who would use the fMRI as a research tool. The next goal of the project was to create a database for the storage of a large number of archived HD-ERP (high-density event-related potential) data sets (approximately 1000 archived cases), and the systematic storage of all future data collected at the site. The database will ultimately be available to interested researchers who wish to study detection of deception. The next goal was to develop a suite of data analysis and display tools with a graphic user interface to work with large arrays of data, and provide a test bed for specific algorithms related to CNS models of deception. Research within our laboratory assesses fMRI and HD-ERP measures of deception in parallel (not simultaneously) then employs a strategy of dipole source localization to reconcile the data. The ultimate goal of our research agenda is to test a variety of aspects of our model of deceptive behavior. Towards that end we have multiple research projects underway that apply to unique constructs within the model. These include, but are not limited to: 1). Executive function, 2) emotional traits, 3) personality traits, 4) attention switching, and 5) workload. The study targeting executive function is still in data acquisition at this time. A pilot study using HD-ERPs examining the impact of depression on deceptive behavior is in final data analysis. The study on personality traits is still in the early stages of item development. The study on attention switching has completed piloting, and is being conducted with an adequate sample size. The study on workload had finished behavioral piloting, and data is currently being acquired in the HD-ERP and fMRI systems.

Aim 1. Develop an fMRI laboratory to function with existing ERP Laboratory.

This aim was the most aggressive of the four. The CATDD (Center for Advanced Technologies for Deception Detection) and the fMRI laboratory have been built within the Palmetto Hospital with dedicated laboratories, office space, and computer support. A Siemens Magnetom Trio 3.0T Magnet has been purchased, installed, and is successfully acquiring data on several protocols. Our next goal was to set up training for faculty and staff at the center.

Although training is to be seen as an ongoing process; faculty, support staff, and students have been trained on the implementation of fMRI (functional brain imaging) based experimentation including: safety issues, basics of MRI including functional neuroanatomical, experimental design, and data analysis. The University of South Carolina has supported this effort by offering Cognitive Neuroscience courses at the graduate and undergraduate level to continuously keep students, staff, and faculty updated. We have transitioned all of the experiment paradigm programs originally developed with E-Prime (Psychology Software Tools, Inc) for use in the ERP (event-related brain wave) environment to the fMRI environment.

Aim 2. Create a comprehensive database for the analysis and storage of ERP and fMRI data.

2a . In order to successfully conduct the data analyses proposed in Aim 3 and 4, all data collected within our studies will need to be accessible within a database structure that allows analysis by several software suites as needed by our hypothetical questions. For this reason we needed to set data standards, and a structure for the database.

Standards for the storage of fMRI data are under active development at several institutions, but several researchers at our site have decided to adopt standards set by the *Data Standards Working Group* (<http://nifti.nimh.nih.gov/dfwg/>). There were several reasons for this decision, among them: 1) the panel contains a broad range of experts in imaging and data standards (see Appendix 1 for membership), 2) the developers of many fMRI visualization and analysis suites have voluntarily adopted these standards, and 3) the software suite USC utilizes for functional analysis has implemented these standards. With respect to the second issue, the programmer of MRICro, Chris Rorden, is located at the University of South Carolina and provides advises the NIFTI format.

The second issue was the storage of HD-EEG/ERP data. The CATDD measures event-related potentials, or several hundred milliseconds of data points from an EEG (Electroencephalogram) record time-linked to a stimulus of interest. Due to the imbedded nature of the ERP signal (within the ongoing EEG), HD-ERP records stored in the database needed to meet the criteria of acceptability required for EEG (Thatcher, 1998). However, data specifications have not been developed in the field of EEG with a goal of maintaining large sets of accessible data. Due a lack of a community developed standard for the data format, we made the decision to store the data within the database as single trial HD-ERP ascii data arrays.

We have constructed a protected data repository with a graphical user interface programmed on the .net framework utilizing a MySQL backend. The data set contains a large number of data points (approximately 1000 subjects (over 20 experiments) X 4-6 conditions X 160 trials each X 1000 ms X 256 samples X 128 electrodes). During the first year of the project we created a documented procedure for data storage and tested the procedure with example data sets. Data can be easily used by SAS (SAS Institute Inc.) and the EMSE (Source Signal, Inc) dipole modeling software. During the next year we will begin populating the data set with our archived data sets. At the beginning of year three we plan to begin several data mining projects.

We have designed and tested a small web-interface (Php code, Apache Server, MySQL Database) that can ultimately be used as the front-end resource to this data. The test has been deployed on the internet (with other tables), and successfully tested.

2b. Develop an ERP data analysis package that can present and analyze ERPs based on the specific requirements of our laboratory. The package we have developed has successfully been used for statistical analyses. However, we need modify the existing package to work with the newly designed storage structures.

The modification of the eERP-Suite data analysis program has been begun, but has not been completed. Substantial modifications have been made to the software to accommodate enhanced graphical features in the .net framework. The ultimate goal of the suite is to facilitate data analysis of large ERP data sets, to provide electrode by electrode graphical representation for dynamic comparisons across time of that data, and to provide a suite for the simultaneous display of fMRI and ERP data.

This software is fully deployable for analysis of HD-ERP data; however, it was originally designed to access tables created from ascii files directly within its architecture. It is more efficient to directly access the already existing files on MySQL. During the current year modifications to the platform to allow direct access to MySQL will need to be to utilize the software as a direct interface to our database system.

Test Case: Demonstration of ErP-Suite Efficacy. Results from an archival data set were analyzed with the newly modified ERP-Suite based on the parameters of the theoretical model that has been developed in our laboratory over the past several years.

Background: Deception is one of the most complex and dynamic socio-cognitive tasks performed by the brain., it is not surprising that ERP research has not identified a singular waveform exclusively associated with the process of deception. Instead, there are a number of waveforms that may result from a combination of several processes occurring within similar time domains. Based on a rich history of research in the area of ERPs, some general waveforms have been identified that may represent these processes: P3a - an early waveform with positive anterior distribution and latency between 250-350 ms, P3b - a positive waveform with parietal distribution and latency between 350-600 ms, and N4 – an anterior waveform with negative deflection with latency of about 400 ms.

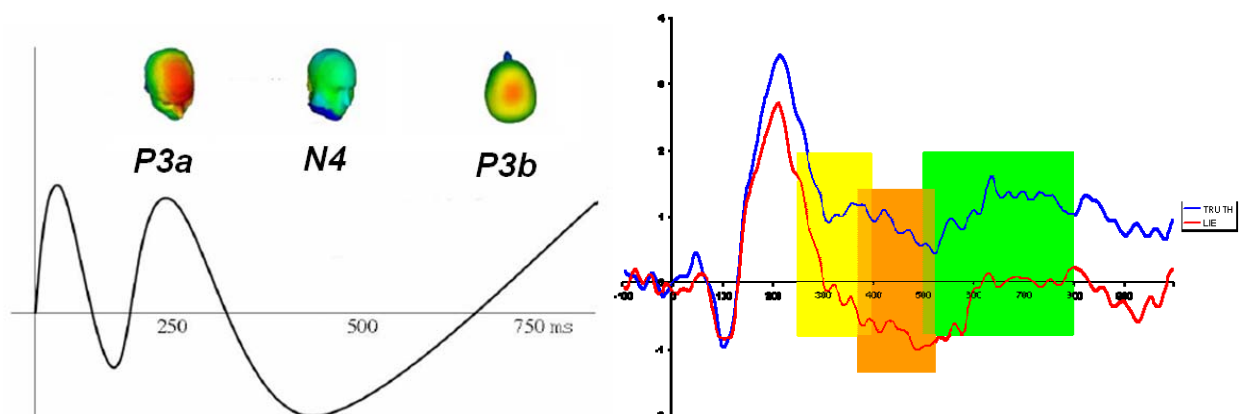


Figure 1. In the Left panel an illustration shows illustrations of the positive anterior waveform (P3a), the negative amplitude (N4) and the positive waveform (P3b) have all been reported in numerous studies of deceptive behavior. They each are correlated with several ongoing cognitive processes during the act of deception: attention is switched, workload demands are assessed, memory for the truthful information is accessed, motivation to deceive is considered, and then a

decision is made. In the right panel, data from a single electrode shows the P3a (yellow), N4 (orange), and P3b (green) for truthful and deceptive responses.

Directed Lie Procedure Participants view (on 29" Color Video Computer Monitor) autobiographical statements that are true or false (randomly presented) followed by a second stimulus to which they responded with a key press indicating agreement or disagreement (see Figure 2). During the experiments, a total of 40 of each response type were presented.

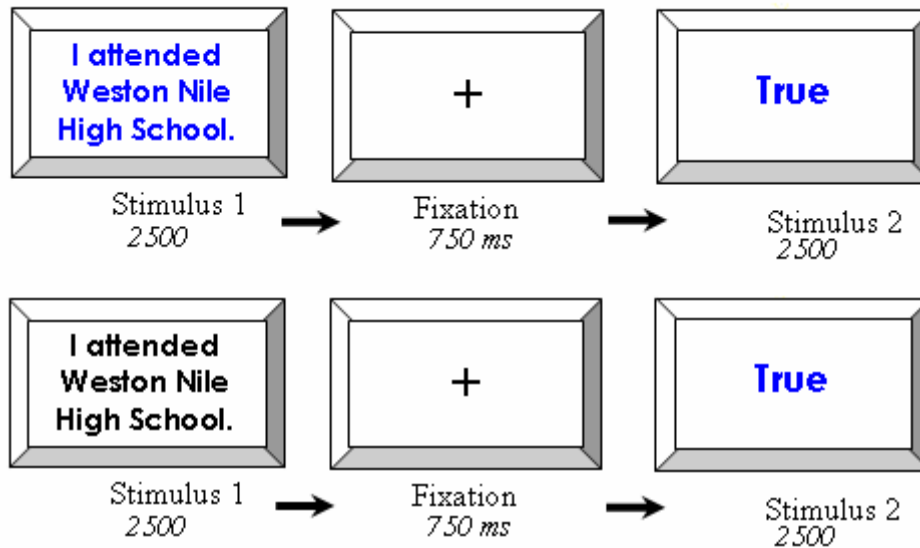


Figure 2. Example stimuli from low- and high workload deception tasks. In the top panel participants are color cued to respond deceptively or truthfully at Stimulus 1, while in the bottom panel participants are prompted to respond deceptively or truthfully at the Stimulus 2.

We compared and contrasted data from two separate paradigms. In study one, participants were provided deception instructions at stimulus 1 (the sentence), while in study two participants were provided deception instructions at stimulus 2 (the word). This made the second paradigm far more difficult for participants.

EXP 1: Low Workload. Experiment: Participants are directed to tell the truth or lie at the first prompt. Demographics: Aged 18-43 ($M = 21.38$); $N=39$.

EXP 2: High Workload. Experiment: Participants are directed to tell the truth or lie at the second prompt. Demographics: Aged 18 to 21 ($M = 19$); $N=19$.

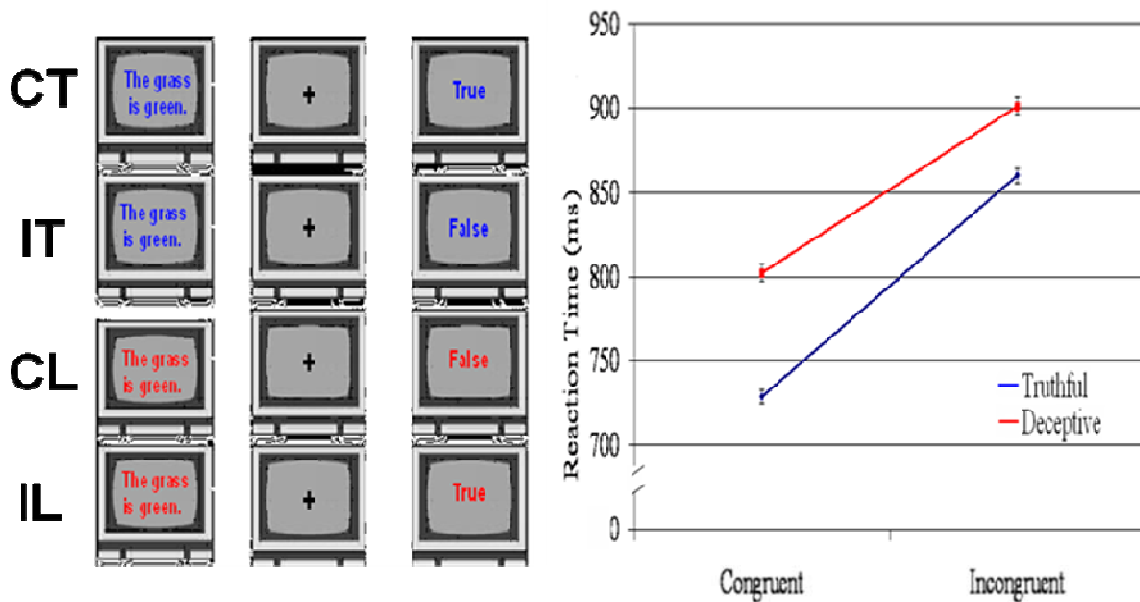


Figure 3. Typical RT findings utilizing this paradigm. As expected participants take approximately 100 ms longer to respond deceptively than truthfully.

Data Acquisition and Processing. RP data were recorded with the EGI Systems Sensornet array (Electrical Geodesics, Inc). Electrodes: 128-channel, $f = 250$ Hz, and $z = 3$ -10 k Ω . Data are segmented using an 100 ms baseline and an 800 ms post-stimulus period. As human EEG peaks in the alpha band (10-12 Hz) data are band-pass filtered at 0.1-33 Hz. Any “bad” channels (e.g., eye blink) are then replaced with their nearest neighbor average and responses are averaged to increase the signal-to-noise ratio (Figure 4):

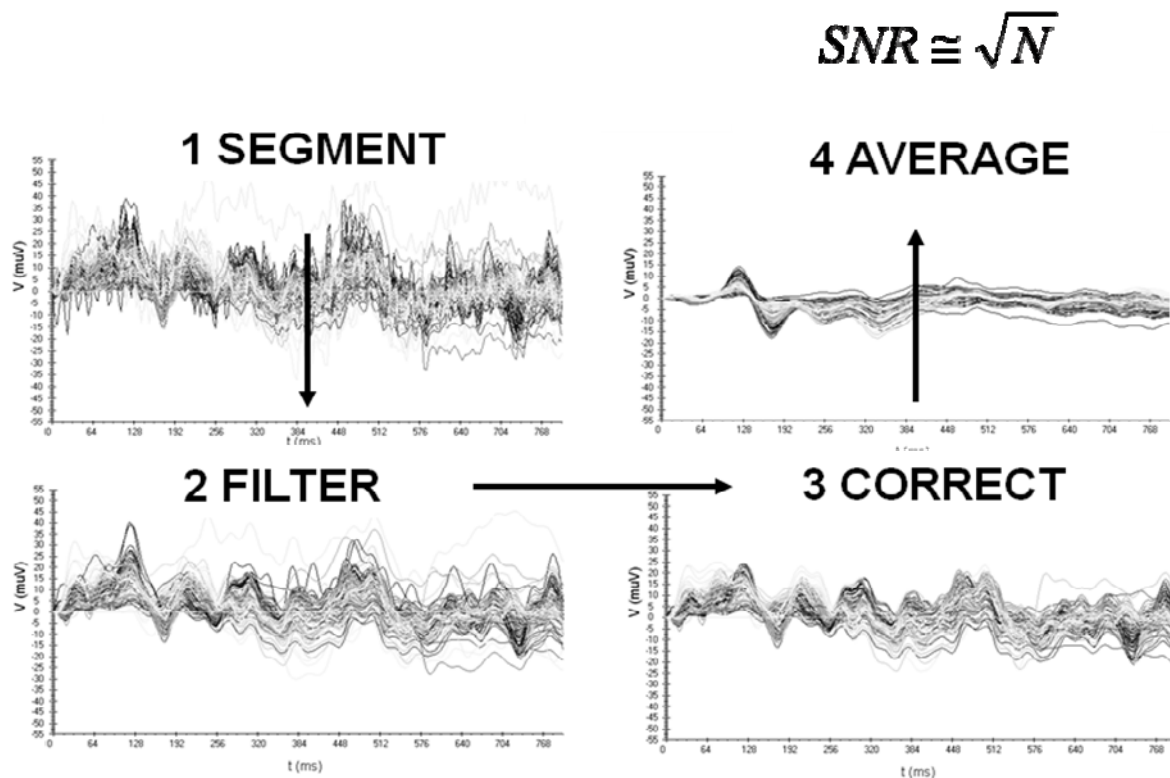


Figure 4. Example trial data from its raw state through filtering, correction and averaging.

Traditional Waveform Analysis

Neurophysiology of Attention. We utilize the well-known Posner constructs of attention to identify general cortical regions that would be recruited during the task: Frontal Lobe – *Organization, Executive Control*, Temporal Lobe - *Short-Term Memory, Orienting*, and Occipital Lobe - *Visual Reception and Recognition*.

Regional Waveforms and Peak Identification. Subject grand average data were scaled and then regional waveform data are plotted for select regions of interest (ROI); all three waveforms are identified and peak amplitude distributions are shown for each.

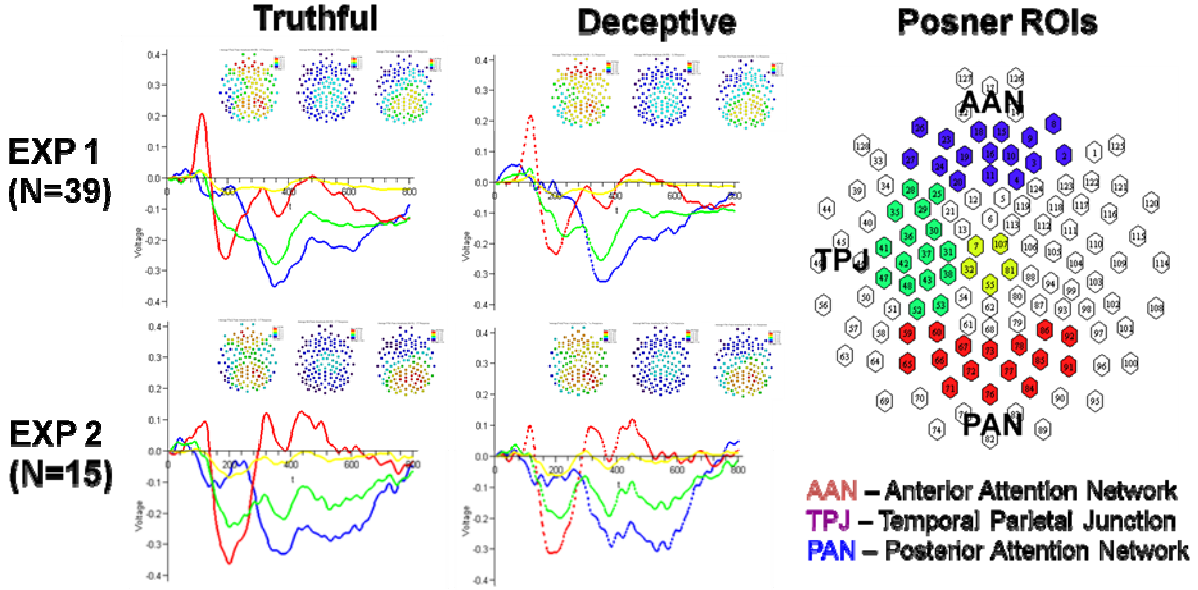


Figure 5. ROIs related to Workload, attention, and shifting aspects of Deception.

ERP Energy and Cognitive Activity

Energy from Power. We integrate the instantaneous channel-power over successive time intervals to obtain a measure of the energy *emitted* during individual response trials Equation 1:

Equation 1. Emitted power during trials.

¹

$$E_n^C(t) = \frac{1}{z} \int_0^t V_n^C(t') V_n^C(t') dt',$$

where z is the impedance value. The differences in response energy are set by population dynamics (Equation 2).

Equation 2

$$E_n^{C_1} = E_n^{C_2} + k_B T \ln \left(\frac{N_n^{C_2}}{N_n^{C_1}} \right).$$

Cognitive Activity

¹ Although the two state modeling system of equations has been developed in our laboratory. The point of the test case was to demonstrate the utility of the software.

We define the *cognitive activity* for ROIS with a weighted sum of the ratio of the channel-energy for one state to the total energy from both states (Equation 3, see Figure 6 for graph of function with experimental data):

Equation 3

$$\eta_{ROI}^{C_i}(t) = \sum_{n \in ROI} \frac{E_n^{C_i}}{E_n^{C_1} + E_n^{C_2}},$$

By construction, the sum over all channels and responses is unity (Equation 4). i.e.

Equation 4

$$\sum_{n=1}^{128} \eta_n^{C_1}(t) + \eta_n^{C_2}(t) = 1.$$

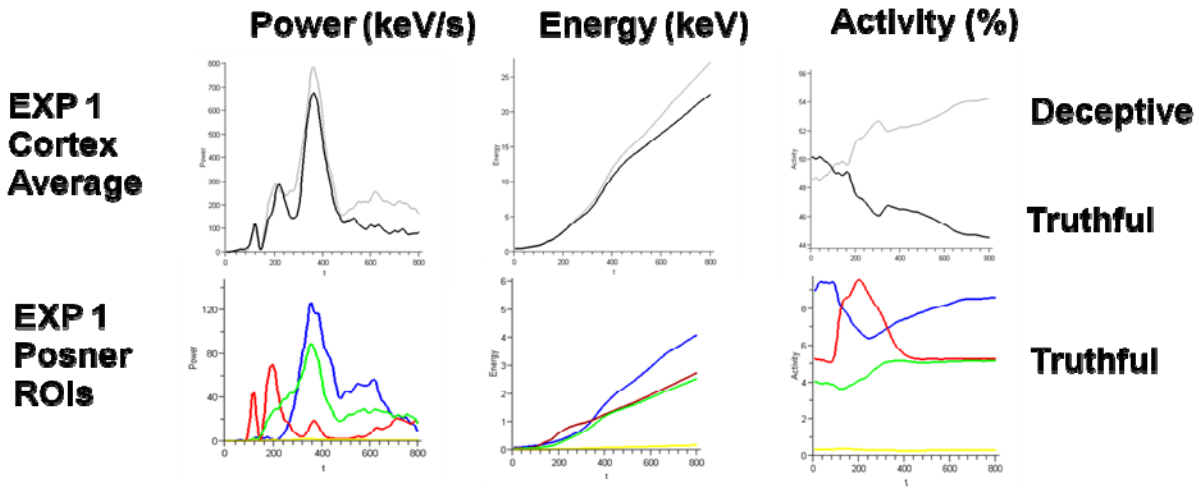


Figure 6. Power, Energy, and Activity in High vs. Low Workload Deception Paradigms. These were calculated with respect to overall cortical activity and Posner Regions of Interest.

NeoCortical Interaction

Attention Based Activity. We observe that cognitive activity levels over the AAN tend toward a minimum value at nearly the same time that activity levels over the PAN reach their maximal values. It is plausible to assert that attention switching between executive control functions in the frontal areas and access to language processing skills in posterior regions may account for this.

Load-Switching Time. We assess *neocortical interaction times* by determining the latency for extrema of the regional activity values. Hence we define the load-switching time as the difference in the maximal PAN and minimal AAN latency values:

Equation 5

$$t_{ls} = t_{PAN_{max}} - t_{AAN_{min}}$$

Neocortical Circuits. A straight forward model of cognition wherein access to memory (TPJ) precedes stimulus processing (PAN) and task execution (AAN) illustrates that truth and deception utilize similar neocortical circuits with different timing (see Table 1).

Table 1. The ERP literature has reported that differences in waveform latency are the most relevant for identifying deception. However, multiple interactions may cause latency shifts. This table illustrates a typical pattern of latency shifting.

EXP	Workload	TASK	Posterior Attention Network Max Latency (ms)	Temporal Parietal Junction Minimum Latency (ms)	Anterior Attention Network Minimum Latency (ms)
1	Low	True	200	124	244
		Lie	188	136	276
2	High	True	220	132	248
		Lie	208	136	276

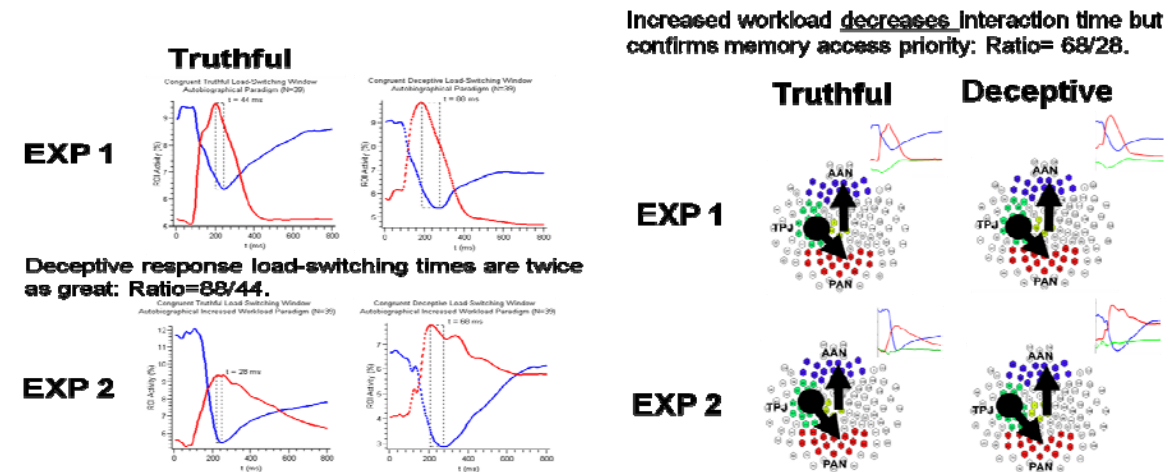


Figure 7. Switch times between deception and truthful responses. This finding is one of the most important findings in our research project, and has been supported by two fMRI studies in our lab (discussed in following sections).

2c. Modify the in house adjunct programming to isolate brain function using dipole source models seeded with

The in house adjunct programming we use to isolate brain function with dipole source models seeded with fMRI data has been developed as a supplementary module for the existing platform available commercially through EMSE (Source Signal, Inc.). Data testing with archival cases has shown that the methodology is sound using standard 4-shell models.

However, EMSE also allows users to create finite element models of the human head. These realistic head models can replace the standard 4-shell models, and ultimately provide greater accuracy for dipole sources. Realistic source models are based on 3-dimensional segmentation

of cortical, CSF, skull, sinus, and head regions from the MRI structural data. Data acquisition with the Siemen's magnet was not immediately amenable to segmentation through EMSE's software platform. During March 2007 the principal investigator consulted with the president of EMSE and determined that the algorithms were not sophisticated enough to extract the required features, and required substantial reconstruction by hand. Further consultation with an imaging physicist improved the quality of the structural MRI images from the Trio Magnet, but did not substantially improve the segmentation. An alternative strategy for segmentation with FSL (FSL 4.0, FMRIB Software Library (Smith et al., 2004) has proven more successful. John Richards, at the University of South Carolina, has successfully utilized this strategy with the EMSE dipole analysis software. We are following his lead and working with him on these data sets. The laboratory is in the process of collecting data, and constructing new data sets with this software.

The influence of deception and stimulus congruity on brain event-related potentials (ERP) was examined in a two-stimulus sentence verification task. In the current study, 20 college-aged participants viewed questions to which they were randomly prompted to respond with two levels of deception and congruity. The resulting ERPs were analyzed with two strategies: 1) a peak picking approach, and 2) a temporal-spatial principal components analysis. Research using the two-stimulus paradigm, has identified distinct potentials related to each of these waveforms using standard peak analysis approaches (Vendemia et al., 2005). The comparison of these techniques and their relationship to a theory of deception suggests that focusing on data analysis strategies that employ multivariate approaches will prove more fruitful than raw data analysis (see Figure 8 vs. Figure 9 results).

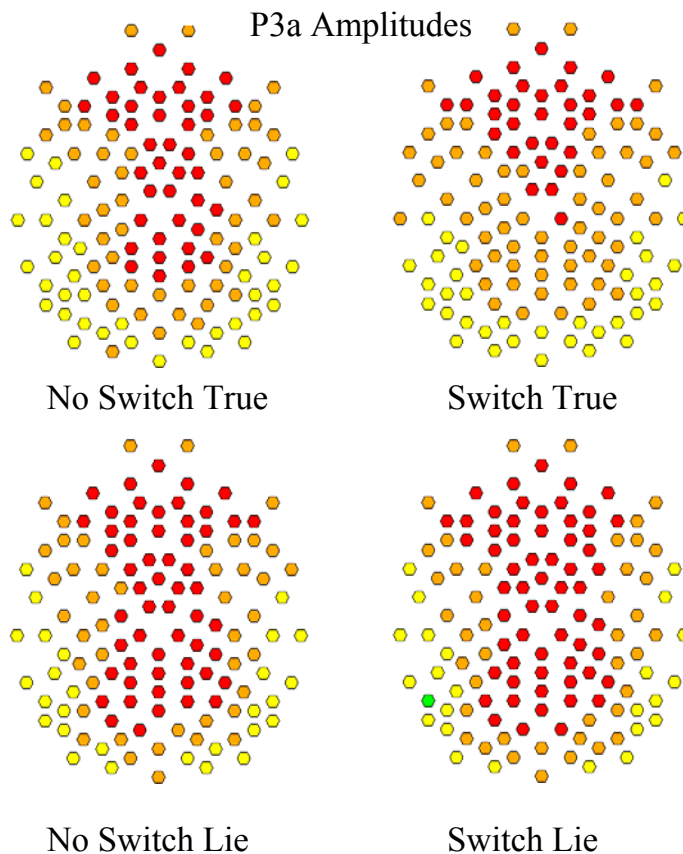


Figure 8. Peak picking analysis of data set. Trend effects were found for deception ($F(1,16) = 4.450, p = .051$) and switching ($F(1,16) = 3.975, p = .064$) for P3a latency. No effects were found for deception ($F(1,16) = .002, ns$) or

switching ($F(1,16) = 1.624$, ns) for P3a amplitude. No effects were found for deception ($F(1,16) = 1.151$, ns) or switching ($F(1,16) = .282$, ns) for P3b latency. No effects were found for deception ($F(1,16) = .998$, ns) or switching ($F(1,16) = .649$, ns) for P3b amplitude. *Post-hoc analyses were conducted using more refined spatial parameters and still no significant effects found

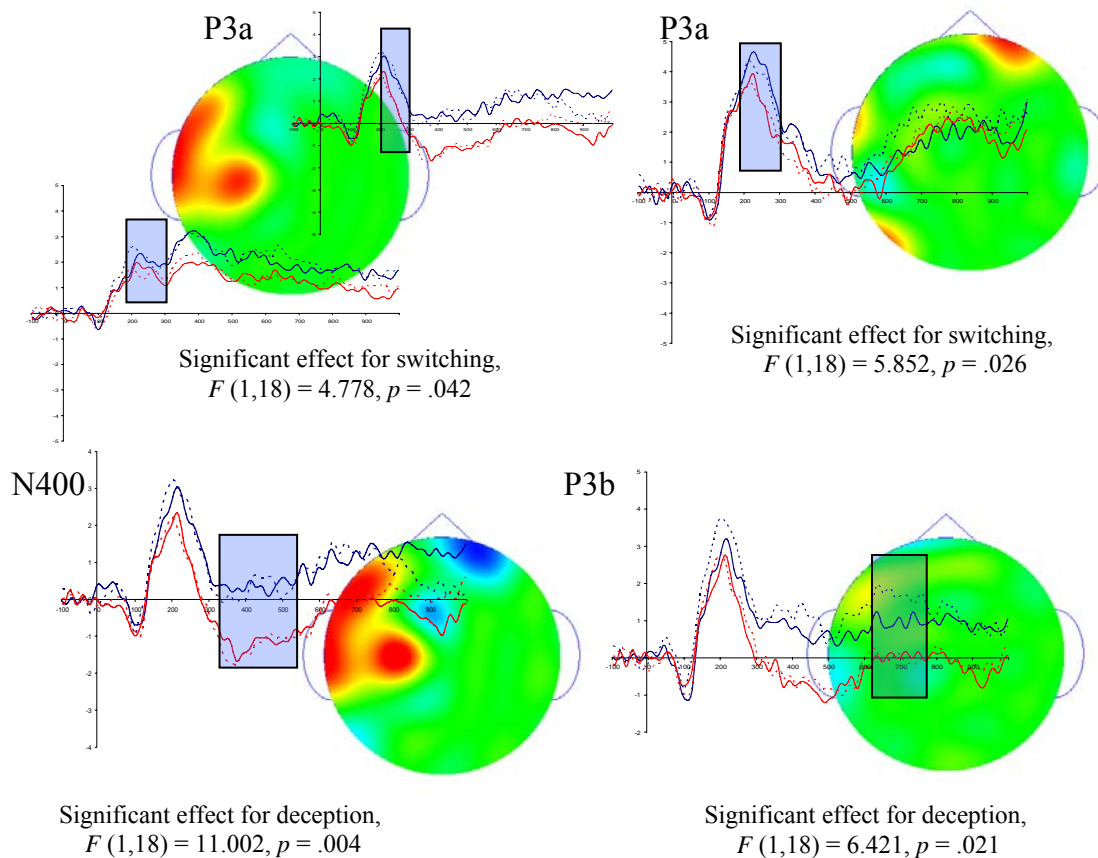


Figure 9. Findings related to switching and deception. In this set of results PCA was followed by univariate analyses of components time linked to the P3a, P3b, and N4.

Aim 3. Establish the impact of cognitive and neuropsychological variables on ERP and pupillometric measure of deceptive behavior.

3a. Establish the validity of the deception model based on ERP measures in the fMRI framework

Event-Related Potential Correlates of Switching Between Truthful and Deceptive Responses

3b. Establish norms for ERP measures and pupillometric measures during deceptive responding based on IQ, neuropsychological function, and level of anxiety.

We have currently embedded a battery of CANTAB neuropsychological tests within every study conducted at the fMRI laboratory. These tests assess a variety of neuropsychological functions including intelligence. We have a standard set of inventories to assess anxiety and depression, and are in the process of refining the personality measures that we plan to administer regularly. At the current time our personality battery is still being piloted.

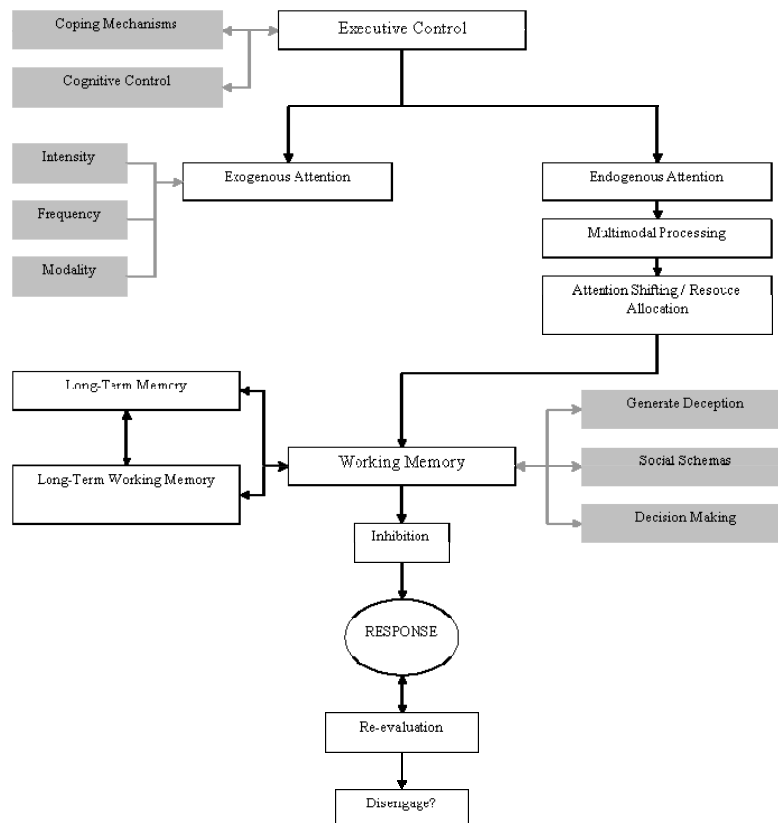
During the year the principle investigator consulted with Michael Bradley in March, May, and November to discuss the use of pupillometric measures during detection of deception.

Michael Bradley conducted the landmark studies combining pupillometry with detection of deception. His input suggested to me that pupillometry is the least stable of the dependent variables we would be collecting, and that we should consider deferring the collection of this data until we have gathered data with our other technologies. He reports that an unduly large number of pupillometry studies have not made it to publication due to lack of results (i.e. the file drawer problem). He felt strongly that the paradigm which I plan to implement the pupillometric measure, one involving working memory load as opposed to threat, should generate measurable pupillometric differences, but that the measure can be unstable. The principal investigator will continue to refine these measures over the next year.

Research from another laboratory suggests that pupillometric measures can be compared directly to fMRI activity in simple stimulus tasks, and that those measures are identical to those resulting in the P3a and P3b. However, the principal investigator will need to investigate the laboratory's method for acquiring the Pupillometry data. Lighting conditions within the fMRI laboratory are not ideal for Pupillometry. Careful control of situational variables is highly recommended.

- 3c. Utilize structural equation models of deceptive behavior to mathematically assess the impact of IQ, neuropsychological function, and level of anxiety on the theoretical model of deceptive behavior developed in our laboratory.

This aim requires the implementation of step 2a-c which are not completed at this time. All of the steps in 2a-c have been begun on time, and are progressing on schedule. With respect to the working model, (see Figure 8). We have collected behavioral data modeling several different frequencies of response, and are collected identical data sets with fMRI and HD-ERP measures.



Aim 4. Establish regions of neurocortical functional activation during deceptive behavior.

4a. Conduct deception research with parallel measures of ERP, fMRI, and pupillometry.

Data collection has begun with respect to ERP and fMRI measures; and will continue through 2009.

Experiments

Numerous RT time studies report greater RT during deceptive responding than truthful responding. Two theoretical explanations have been posed in the literature: 1) Increased working memory load during deceptive responding results in increased RT at deceptive responses, 2) Allocation of attention resources to the highly salient deceptive-cue conditions results in a greater latency. The working memory load theory has been primarily utilized in studies where deceptive and truthful responses occur equally, while the allocation of attention resources explanation predominates when infrequent deceptive trials are placed among frequent truthful trials. Comparisons of event-related experiments within our laboratory suggests a potential third mechanism sub-serving reported RT differences, attention switching. In two experiments using behavioral and fMRI measures we test several hypothetical interactions of these theoretical mechanisms by manipulating the ratio of truthful to deceptive responses in a two-stimulus sentence verification task.

Workload Deceptive responding requires more cognitive effort than truthful responding. It has been reported that the P3b waveform amplitude decreases and waveform latency increases with increased working memory load, and results in increased reaction times (RT's). The effect of workload should occur maximally when deceptively-cued trials are presented very frequently (greater than 60%), but will be measureable at all ratios. Working memory load related to evaluating multiple streams of information is related to activity in BA 10. We expect to see activation in BA 10 in the 50% condition, during deceptive no-switch trials vs. truthful no switch trials, and during deceptive no-switch trials vs. deceptive switch trials.

Stimulus Salience In studies of event-related activity (ERPs) low-frequency stimuli, or oddballs, produce an increase in P3b waveform amplitude and elicit longer RT's than equal- or high-frequency stimuli. This effect is maximal at parietal electrodes, and has been demonstrated with several types of deceptive responses. As deception is more salient than truth telling we would expect to see an increase in deceptive, but not truthful RTs when response ratio is low (10% and 20% trials).

Attention allocation related to salience: Previous ERP evidence from our lab has linked the posterior parietal activation (N2b waveform) to preparedness to deceive. We should see this attention effect in posterior parietal areas, specifically BAs 40 and 7 when comparing 20% condition 50% conditions on deceptive trials.

Attention Switching. Switching attention from an easier task to a more difficult task produces a decrease in P3a amplitude and an increase in RT. The effect of attention-switching should occur maximally when deceptively-cued trials are presented equally with truthfully-cued trials. Therefore we should see an increase in RT for BOTH deceptive and truthful trials when presentation is at 50%.

Methods

Task Construction

Directed Lie Procedure

Participants viewed autobiographical statements that were true or false (randomly presented) followed by a second stimulus to which they responded with a key press indicating agreement or disagreement.

Participants were prompted to either tell the truth (blue) or lie (red). Intra-trial switching between truth and deception occurred in four different ways as depicted below.

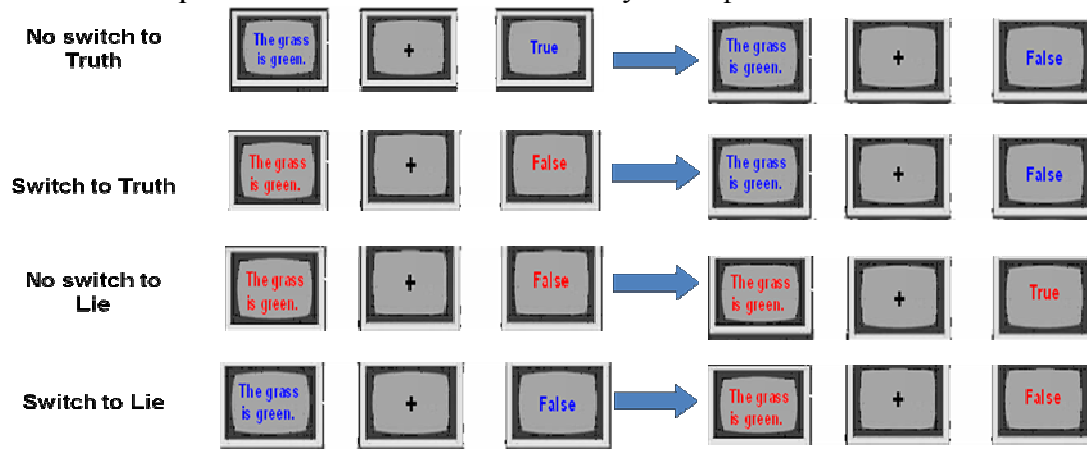


Figure 11. Illustration of Deceptive and truthful condition stimuli sequences in the two-stimulus semantic verification task. Each sequence consists of a sentence a fixation prompt and a response stimuli. IN CONTRAST TO Figure 4 each line represents two trial sequences with the critical variable of interest being the switch between trials.

Participants

The behavioral experiment in this study investigated 179 undergraduates (54 males, 125 females) with ages ranging from 17 to 37 years ($M = 19.47$, $SD = 2.33$). Two participants were excluded from analysis due to 0% accuracy on all trials.

Design and Procedure

Participants responded deceptively on a percentage of the trials and truthfully on the remaining trials. Participants were randomly assigned to one of seven conditions (10% deceptive responses (DR), 20% DR, 40% DR, 50% DR, 60% DR, 80% DR or 90% DR). Switching and congruity (agree vs. disagree) were balanced across conditions. Participants responded more quickly in truthful trials than deceptive trials in all response ratio groups, $F(1, 172) = 47.81$, $p < .001$.

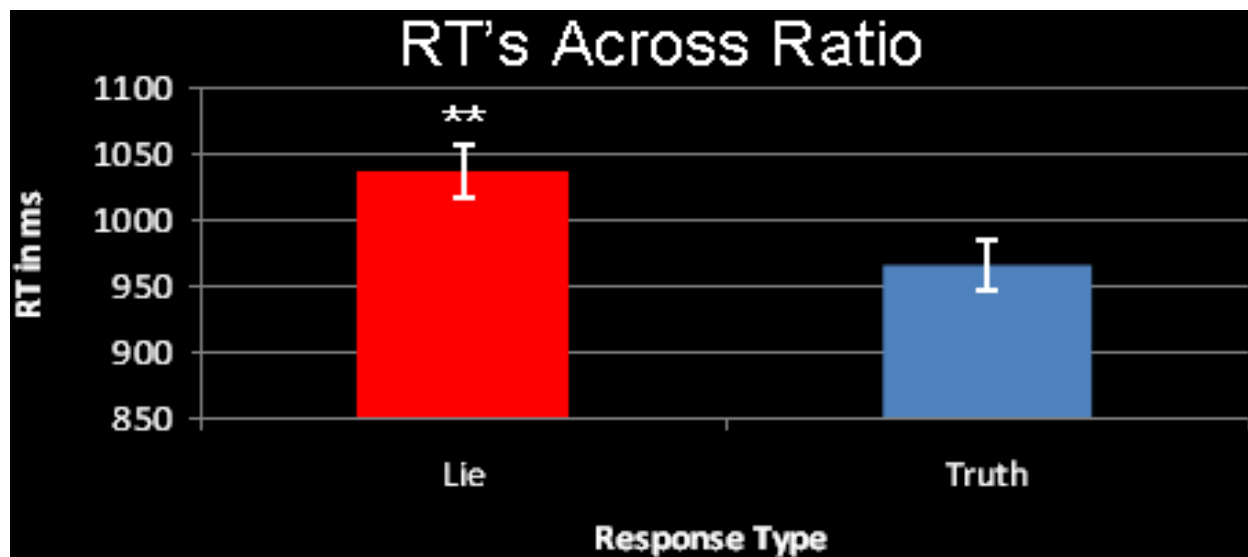


Figure 12. Comparison of truthful response times compared to deceptive response times across all trial ratio. Participants took longer to deceive than tell the truth regardless of the ratio of deceptive responses to truthful responses.

However, the cumulative difficulty of deception was not measurable at higher ratios of deceptive responding. Stimulus salience impacted RT when the overall ratio of truthful to deceptive response was greatest (10% trial frequency), $t(52) = 2.24, p < .05$. Matched ratios of truthful and deceptive responses did not differ significantly when overall ratio was lower.

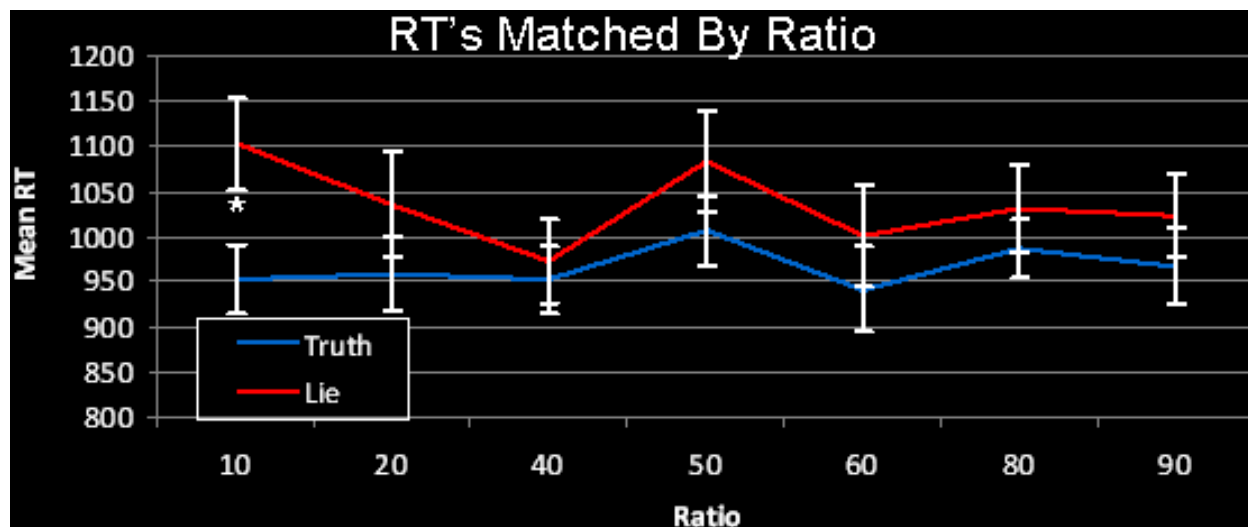


Figure 13. Comparisons of response times of the matched ratio responses (for example, individuals' deceptive trials who responded 10% deceptively, were compared with truthful trials for those who responded 10% truthfully).

fMRI Analysis and Results

Voxel-wise analysis was carried out using flexible hemodynamic response function (HRF) modeling, allowing HRF to vary spatially and between subjects. fMRI time series data was analyzed with a fully Bayesian hierarchical statistical model, in which spatial dependencies were represented by conditioned autoregressive priors, and the linear model was used for temporal dependencies. The posterior distributions were estimated using the Variational Bayes framework. Analysis was carried out using FEAT (fMRI Expert Analysis Tool) Version 5.63, part of FSL. Z (Gaussianised T/F) statistic images were thresholded using clusters determined by $Z > 2.3$ and a (corrected) cluster significance threshold of $P = 0.05$. Only correct trials were

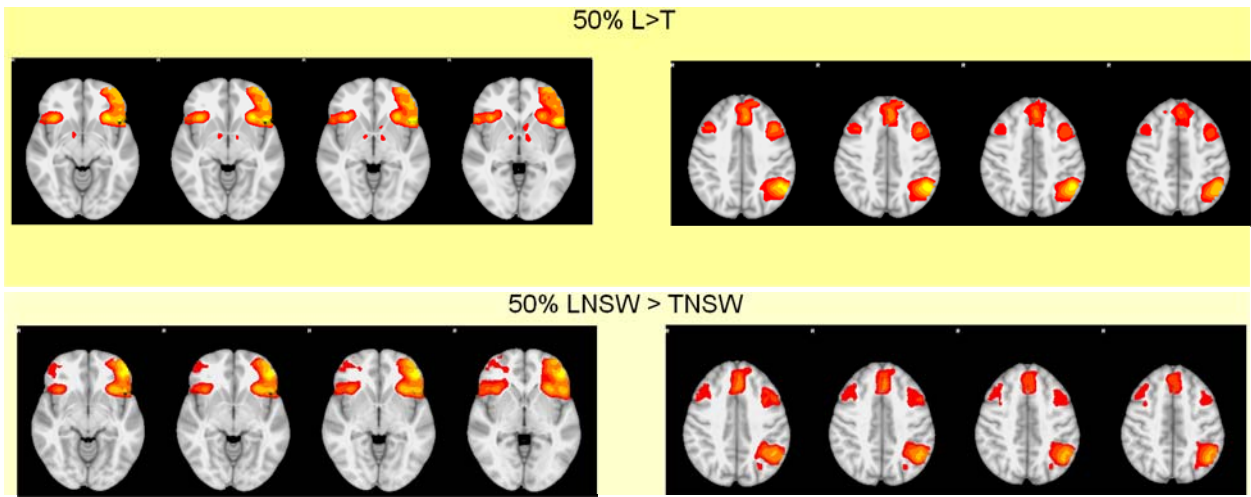
included in the group analysis. The 20% condition was balanced by randomly selecting correct responses from the truthful switch/no switch condition to match the number of correct deceptive switch/no switch responses

Table 2. The number of trials were matched for each comparison: Lie Switch - True Switch, Lie No-Switch - True No-Switch, Lie Switch - Lie No-Switch, True Switch - True No-Switch.

	Truth	Lie
Switch	Match LSW	Match TSW
No Switch	Match LNSW	Match TNSW

Table 3. Brodmann's Areas of Activation in the 50% response ratio group. Areas in related to working memory, sentence evaluation, and attention were activated more strongly during the Lie Condition than during the true condition.

Region (L)	BA	Lie > True				Lie NSW > True NSW			
		Z	Tal (x y z)			Z	Tal (x y z)		
Inferior frontal gyrus	47	5.52	-50	18	3	4.33	-46	44	-7
Middle frontal gyrus	10	5.02	-37	58	4	4.58	-38	55	-4
Inferior parietal lobule	40	5.44	-51	53	42	4.53	-45	58	44
Superior parietal lobule	7	4.35	-38	-60	50				



Discussion
Behavioral

Previous findings in our replicated in finding that overall deceptive RT's are significantly longer than truthful RT's regardless of the frequency of presentation. Stimulus salience, rather than attention-switching or workload, significantly impacts the behavioral response, producing significantly longer RT's for deceptive responses when frequency of presentation is low. We will attempt to replicate these findings using non-deceptive stimuli in attempts to discover whether these results are specific to deception or related to general processes. Additionally, we plan to carry out several split half comparisons of this data in order to determine if working memory load at higher rates of responding result in degradation of performance related to tiredness.

Imaging

Effects of workload were supported in the 50% condition. Analyses revealed greater activation in left frontal areas during deceptive trials in the 50% condition. Analyses revealed greater activation in left frontal areas when comparing deceptive no switch trials to truthful no switch trials. This data replicates our previous findings (see Figure 4) with respect to lie > true response activations, and lie no-switch vs. true no-switch conditions (Sanchez, Meek, Phillips, & Vendemia, 2007).

In contrast to what was expected, we did not find any differences between the 50% and 20% conditions regarding workload or attention. However, we expect to see this effect as we work with a larger with a larger sample size. We found activation in posterior parietal areas during deceptive trials in the 50% condition, suggesting that this network is active regardless of deceptive trial frequency and is may be more related to salience rather than attention switching. However, we were not able to carry out several comparisons within the switch trials as we could not sample enough data with this paradigm.

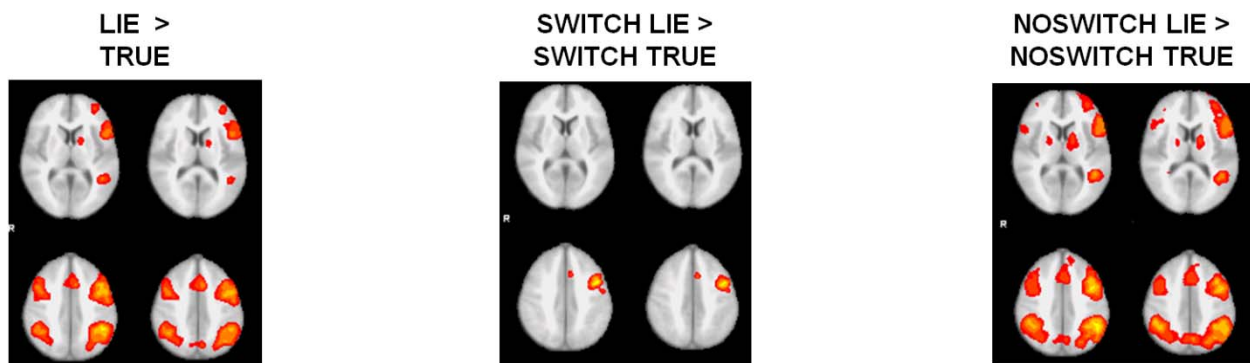


Figure 14. Data from pilot study (N=10).

- 4b. Establish norms for fMRI activations during deceptive responding based on IQ, neuropsychological function, and level of anxiety.

Data collection has begun on schedule and will continue throughout the project.

Aim 5. Identify socio-cognitive variable that impact deceptive behavior.

- 5a. Expand the research program to begin investigating the impact of socio-cognitive variables such as culture, religious upbringing, and environment on the formalized model of deception which will substantially improve its reliability, validity, and generalizability across cultures.

Experiment

This process will be ongoing throughout the course of the research program. Our first goal has been to create a self-report questionnaire that assesses deceptive behavior in a standard western English speaking culture. Previous research has explored people's beliefs about their own deceptive behavior as well as the deceptive behavior of others. There are two reasons to utilize a self-report strategy this stage of the research. The first is that individuals tend to be more accurate regarding beliefs about their own deceptive behavior compared to beliefs about others' deceptive behavior (Akehurst, Kohnken, Vrij, & Bull, 1996). The second reason is that theoretical reasoning subserving the questionnaire model can be tested fairly quickly. Of particular concern to the research team was that not all types of verbal deceptive behavior are considered similar, which may ultimately contribute to variability within central nervous system measures.

People lie overwhelmingly about themselves, compared to lying about others or impersonal topics. Motives are more likely to be self-serving, particularly for psychological reasons (e.g. protection from embarrassment) as opposed to personal advantage (e.g. material gain) (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996). Participants felt that their lies were generally not serious lies and required little effort to plan. There are correlations between patterns of deceptive behavior and personality measures. In general, less highly socialized people, and people who have less gratifying same-sex relationships tell more self-serving lies, whereas people with higher quality same-sex relationships tell more other-oriented lies (Kashy & DePaulo, 1996).

Understanding different types of deception is especially important and relevant to our lab because we investigate the neural correlates of deception. In addition to behavioral differences in lies, all lies may not have the same underlying neurocognitive substrates. For example, engaging in deception by telling a lie for personal gain may not create the same pattern of cortical activity as engaging in deception by telling a white lie. Telling a lie for personal gain may require more planning, more working memory resources, and more overall cognitive effort than telling a white lie. If we are investigating deception as one large category, we may not be measuring the neurocognition of deception as accurately as we could be.

A multi-step process generated the different categories of deception. First, a lexical search of English words for lying and lies utilizing Roget's 21st Century Thesaurus in Dictionary Form, The American Heritage College Dictionary (3rd Ed), Cambridge, Oxford, Encarta, Webster, Wordsmyth, and Ultralingua (see Appendix 2).

Lexical searches provide a way to gather insight into processes that occur within subclinical populations, and may vary with macro level variables (Bainbridge, 2003). An additional advantage of the lexical search is that there is a strategy represented within the trait theory literature to apply lexical search across cultures (Almagor, Tellegen, & Waller, 1995; Benet-Martínez & Waller, 1997; Chuang & Lee, 2001; Kashiwagi, de Raad, & Perugini, 2002; Mlacic & Ostendorf, 2005; Saucier, Hampson, Goldberg, & Hampson, 2000; Szarota, 1996; Szarota, Ashton, & Lee, 2007; Whissell, Povey, & Dewson, 1987).

The English language search identified 111 potential words related to deception. In order to determine if any observable patterns amongst the words, two independent observers rated each of the words on a series of characteristics (e.g. verbal, nonverbal, written, personal gain, detriment of others, protection of others, etc.). Each word was assigned a 1 if it belonged to the category and a 0 if it did not. No categories were considered mutually exclusive from one another (i.e. it was possible to receive 1's in both verbal and non-verbal). Following this rating procedure, a principal components analysis was performed on the 21 categories for each of the 11 words.

A ten component solution explained 88.06% of the variance in ratings (see Figure 1 for correlation matrix). The first component (21.13% of the variance) appeared to have more than

one potential dimension imbedded within it. For the purposes of the next portion of the initial questionnaire design, the words that were highly correlated with this component were submitted to a further PCA based on variance between the rating scales i.e. Component 1a. (Distort, Embellish, Fable, Fabricate, Juggle, Profess, Tale) and 1b. (Bear False Witness, Concoct, Falsehood, Fib, Hyperbole, Tale Story, Warp).

In order to refine the initial categories, specialists from the field of interview related detection of deception were recruited as experts to provide feedback on the initial categories. Using these classifications, a questionnaire was developed which arranged the words into 12 different groups. This questionnaire was administered to 14 experts in the field of deception. One expert's data was thrown out because the questionnaire was filled out incorrectly. This questionnaire first asked the experts to come up with a definition that they thought best fit each group of words (e.g. "lies for gain"). Next, they were asked to read through all of the words in each group and rate them based on how well they thought the word matched their definition on a scale of 0 – 4 (0 = not related, 1 = poorly related, 2 = moderately related, 3 = highly related, and 4 = perfectly related). Correlations were performed for each word within a given list. The single word with the highest intercorrelation was chosen as the "representative" word, and all other words are evaluated with respect to the "representative". An example of the results is shown in Figure 12.

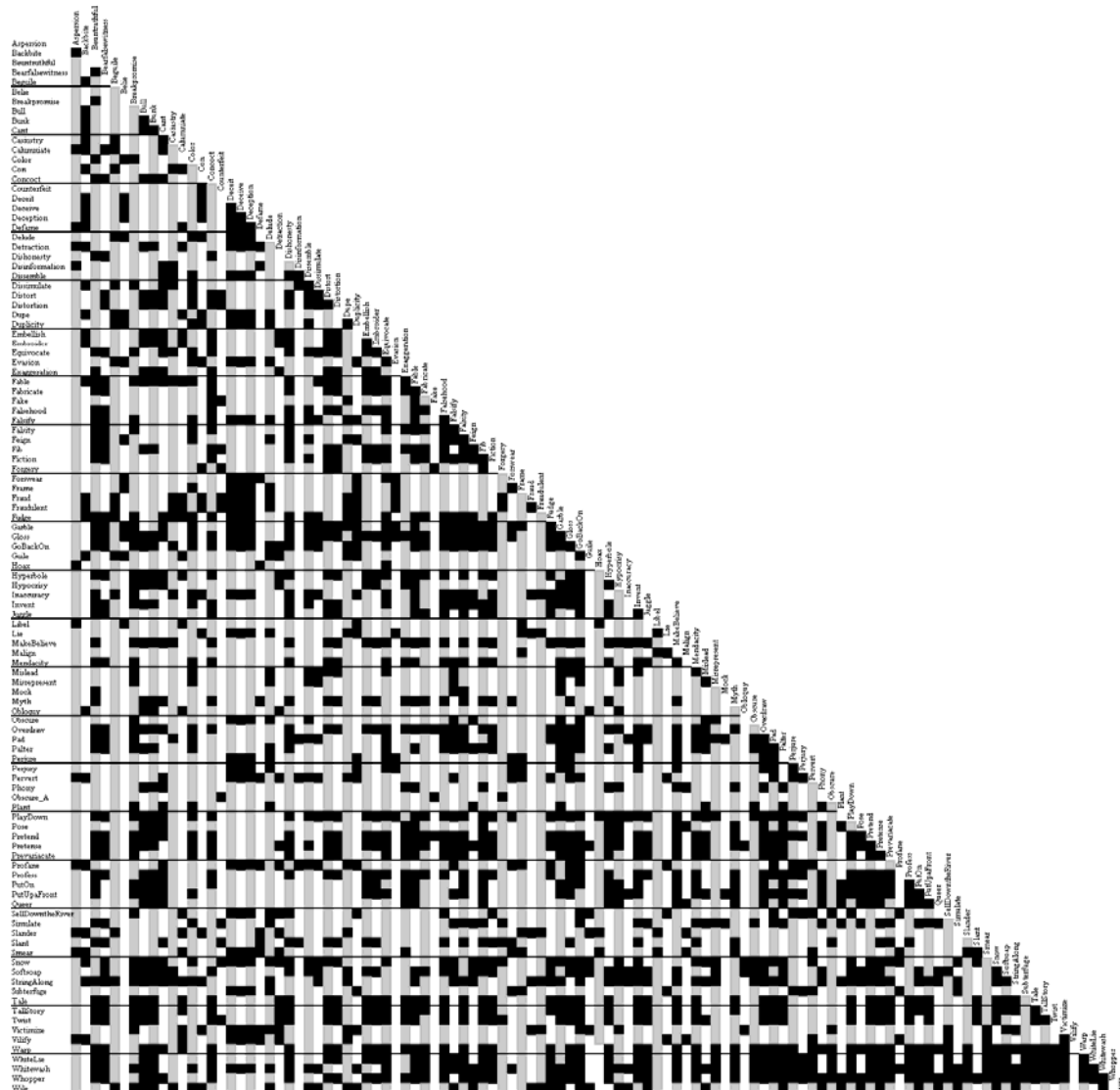


Figure 15. Correlation matrix of pattern of representation across dimensions of deception.

Component 2 explained 9.82% of the variance in the ratings. The words in this category were Pose, Phony, Queer, Put On, Mock, Put up a Front, Whopper, Bull, Bunk, Plant, Cant, and Simulate. Based on experts' open-ended definitions (see Table 4), we came up with a final definition of "Interpersonal Ploy" for this category. Our final word list became Queer, Put On, Mock, Put up a Front, Whopper, Bull, Bunk, Cant, and Simulate (see Figure 12).

Table 4. Experts' Open-Ended Definitions of Deceptive Word Categories.

Expert's Definitions. Component 2 "Interpersonal Ploys"
1. Lie; misinformation; patronize/politicize; poke fun at; insincere; covert operative; act/pretend; deceive; odd; black lie
2. Lie for fun
3. Lies people use to bolster their social interaction
4. Verbal comments made to give a false impression of the actual truth
5. Misrepresentation
6. An exaggeration without doing any real harm
7. Fake
8. Misleading lies
9. To be somebody you're not
10. Exaggeration
11. Relates more to a personality ploy, i.e. lie like a car salesman
12. Lies to misrepresent oneself
13. A lie that is made up or fabricated

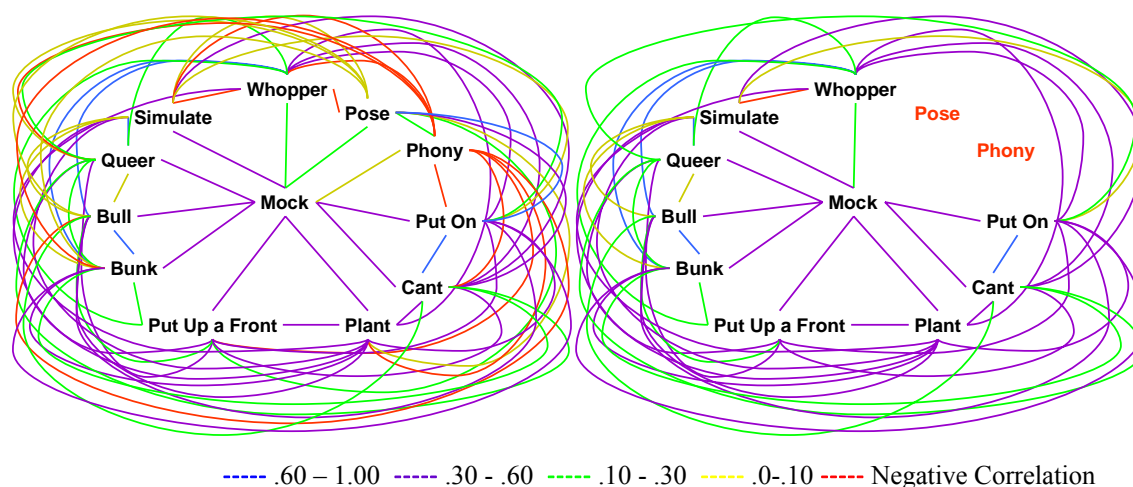


Figure 16. Left panel, correlation graph of word belongingness to the Interpersonal Ploy category. Center word has the largest mean intercorrelation with remaining words. Right panel, poor correlations removed.

Component 3 explained 9.43% of the variance in the ratings. The words in this category were Profane, Pervert, Deception, Deceive, Deceit, Defame, Subterfuge, Forswear, Aspersion, Smear, Vilify, Perjure, Perjury, Sell down the River, Malign, and Pad. Based on experts' open-ended definitions (see Table 2), we came up with a final definition of "Malicious Lies for Gain" for this category. Our final word list became Sell down the River, Defame, Perjure, Perjury, Pervert, Malign, Forswear, Profane, Aspersion, Pad, Vilify, Smear, Slander, and Smear (see Figure 14).

Table 5. Experts' Open-Ended Definitions of Deceptive Words related to "Malicious Lies for Gain".

Experts' Definitions "Malicious Lies for Gain"
1. Slander; trick; dupe; perjure; malicious; written lie; lie under oath; distort the truth; disloyal; strategic lie; defame
2. Lie to hurt others
3. Lies to damage rivals, enemies, or others
4. A verbal statement made on purpose in order to detract from the actual truth
5. To demean or false represent
6. Providing information which is not true
7. Intentionally mislead
8. Intentional deception
9. To deceive another person by telling a lie
10. Lies in a formal setting
11. Relates to a manipulative personality
12. To present false information for the purpose of misleading others
13. To lie about an event or circumstance

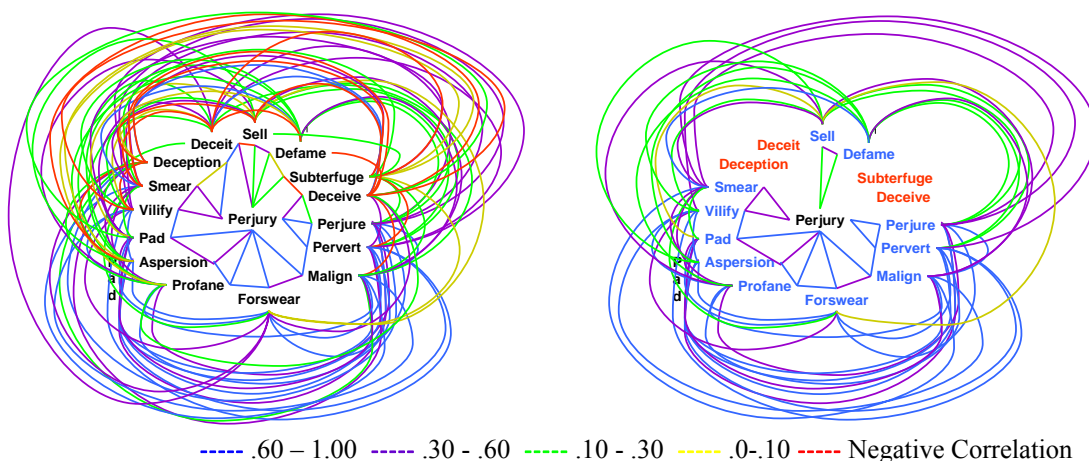


Figure 17. Left panel, correlation graph of word belongingness to the Malicious Lies for Gain category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

Component 4 explained 8.47% of the variance in the ratings. The words in this category were Inaccuracy, String Along, Obscure, Mislead, Prevaricate, Garble, Color, Hypocrisy, Snow, Falsify, Mendacity, Break Promise, Misrepresent, and Palter. Based on experts' open-ended definitions (see Table 3), we came up with a final definition of "Concealments of the Truth" for this category. Our final word list became Misrepresent, Break Promise, Mendacity, Falsify, Snow, Hypocrisy, Color, Garble, and Prevaricate (see Table 6).

Table 6. Experts' Open-Ended Definitions of Deceptive Word Categories for Concealments of Truth.

Expert Definitions "Concealments of Truth"
1. Renig; slant; lie generally written; distort; double standard; framed; lie for purpose; lie by omission; verbal lie; evade; con
2. Lie indifferently
3. Lies to hide your own mistakes

4. To lead on or display untruthfully
 5. To provide unbelievable or misleading information
 6. Giving someone the wrong impression
 7. Deceive
 8. Dishonesty
 9. To mislead a person about the truth
 10. Present an untrue persona
 11. Lies in the press
 12. Lie for personal gain
 13. This appeared to have too great a range of lying
-

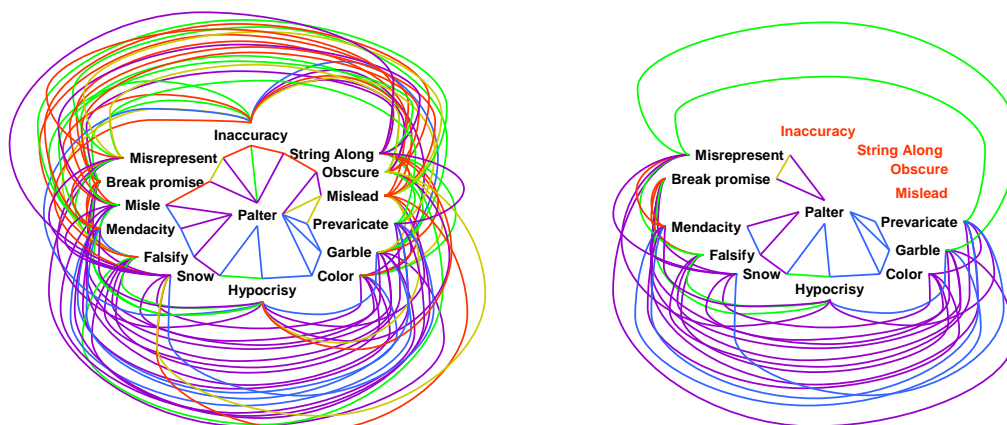


Figure 2. ---- .60 – 1.00 ---- .30 - .60 ---- .10 - .30 ---- .0-.10 ---- Negative Correlation

Figure 18. Left panel, correlation graph of word belongingness to the “Concealments of the Truth” category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

Component 5 explained 7.13% of the variance in the ratings. The words in this category were Beguile, Dupe, Fraudulent, Duplicity, Calumniate, Delude, Frame, Con, Hoax, Libel, Fraud, Lie, Slander, and Smear. Based on experts’ open-ended definitions (see Table 7), we came up with a final definition of “Misleading Lies for Gain” for this category. Our final word list became Beguile, Dupe, Fraudulent, Duplicity, Calumniate, Delude, Frame, Fraud, Con, Hoax, Libel, and Victimize (see Figure 16).

Table 7. *Experts’ Open-Ended Definitions of Misleading Lies for Gain.*

Expert Definitions, “Misleading Lies for Gain”
1. Deceit, slander, cheat by lie; understate; con successfully; verbal lie; falsely incriminate; lie for gain; fictitious lie for trickery; responsible for lie; untruth; libel; lie to affect reputation
2. Lie to steal
3. Lies to shift blame or responsibility onto others
4. To trick or deceive someone from the actual truth
5. To lie with intent of harming someone or something
6. An exercise to obtain something from someone or cause someone to give something up
7. Intentionally mislead
8. Criminal cheating
9. To lie about what has happened by giving false information

-
10. Deception by trickery for profit or personal gain
 11. Act of lying for profit
 12. Lies for personal gain
 13. Lie by misrepresenting
-

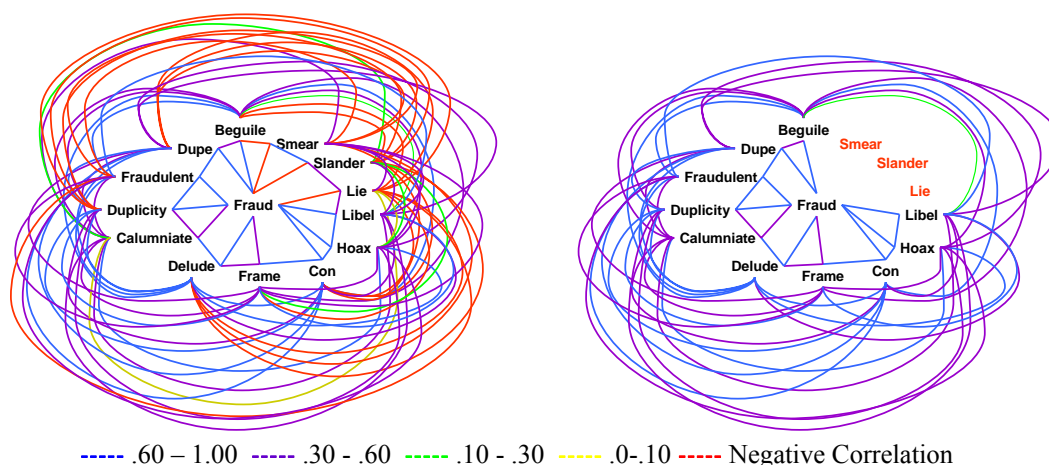


Figure 19. Left panel, correlation graph of word belongingness to the “Misleading Lies for Gain” category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

Component 6 explained 7.03% of the variance in the ratings. The words in this category were Obscure, Victimize, Fraud, Fraudulent, Con, Counterfeit, Forgery, and Fake. Based on experts’ open-ended definitions (see Table 8), we came up with a final definition of “Written Falsifications for Gain” for this category. Our final word list became Obscure, Fake, Fraud, Forgery, Counterfeit, Con, and Fraudulent (see Figure 17).

Table 8. *Experts’ Open-Ended Definitions of Written Falsifications for Gain*

Expert Definitions, “Written Falsifications for Gain”
1. trick by deceit; forgery/copy illegally; feign; written illegal copy; false presence; created under falsehood; to hide/conceal; prey upon for personal gain
2. Lie for immediate financial gain
3. Lies for gain
4. A purposeful misrepresentation of the truth
5. Dishonest behavior
6. Deliberate lie for self gain
7. Hoodwink
8. Lie with criminal intent
9. To defraud from an individual
10. Falsification of a document
11. Written methods of deceit
12. To lie for gain
13. Lie by representing in an inaccurate manner

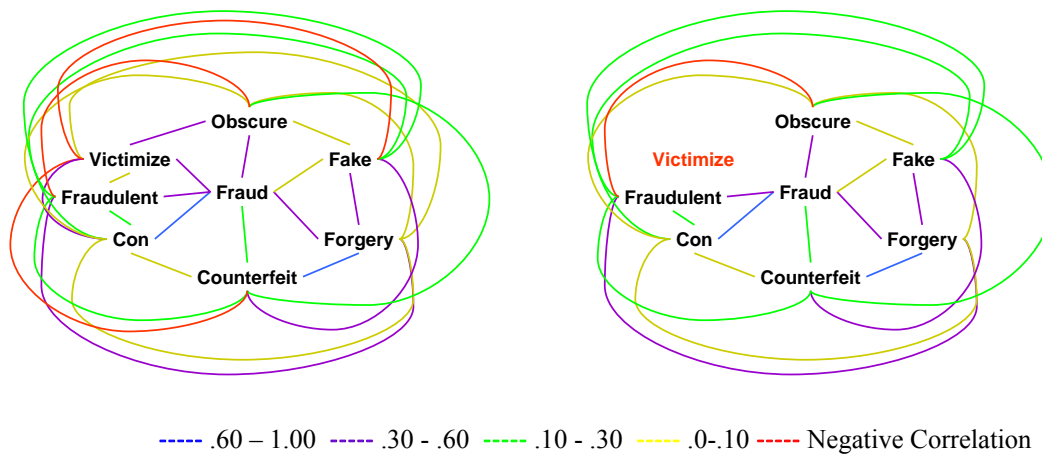


Figure 20. Left panel, correlation graph of word belongingness to the “Written Falsifications for Gain” category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

Component 7 explained 6.83% of the variance in the ratings. The words in this category were Beguile, Disinformation, Soft-soap, Dissimulation, Dissemble, Casuistry, Wile, and Feign. Based on experts’ open-ended definitions (see Table 9), we came up with a final definition of “Verbal Trickery” for this category. Our final word list became Soft-soap, Dissimulation, Dissemble, Casuistry, Wile, Feign, Obscure, and Mislead (see Figure 18).

Table 9. *Experts’ Open-Ended Definitions of Verbal Trickeries*

Expert Definitions, “Verbal Trickeries”
1. Cheat/annoy; mislead; lie; covert; disguised intent; fake; understate; waste
2. Lie to help others (protect others)
3. Lies to mislead others
4. To misrepresent something so as to trick/deceive someone
5. To tell less than the truth
6. Misleading for gain
7. Trickery
8. Cheat
9. To lie about information when all facts are not in
10. Trickery
11. Verbal acts of deceit
12. Lies to misrepresent
13. Lie by claiming ignorance or by claiming something that isn’t

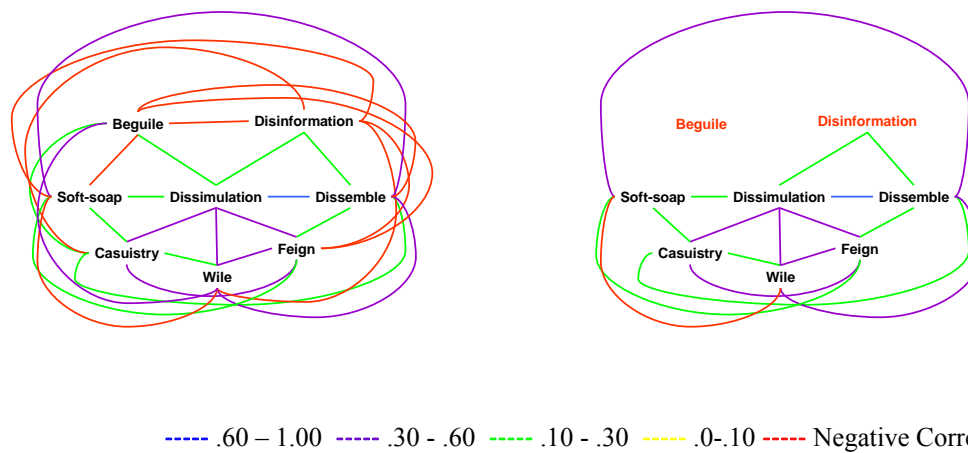


Figure 21. Left panel, correlation graph of word belongingness to the “Verbal Trickery” category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

Component 8 explained 6.13% of the variance in the ratings. The words in this category were Equivocate, Perjure, Play Down, Evasion, Color, Gloss, Perjury, and Belie. Based on experts’ open-ended definitions (see Table 10), we came up with a final definition of “Lies for Avoidance” for this category. Our final word list became Equivocate, Play Down, Evasion, Color, Gloss, Belie, and Whitewash (see Figure 19).

Table 10. *Experts’ Open-Ended Definitions of Avoidance Lies.*

Expert Definitions “Avoidance Lies”
1. Hide feelings; slant; evade truth; white lie; lie under oath; understate
2. Lie to protect self
3. Lies to avoid personal responsibility
4. To misrepresent or make something seem different on purpose
5. To tell less than the entire truth
6. Lie of lesser degree
7. Slant
8. Minimize a lie
9. Not tell the truth about an incident
10. Make light of
11. Lies in a courtroom, or lawyer speak
12. Lies to avoid or lies to misguide
13. Lie by distracting or playing down, maybe be nonverbal

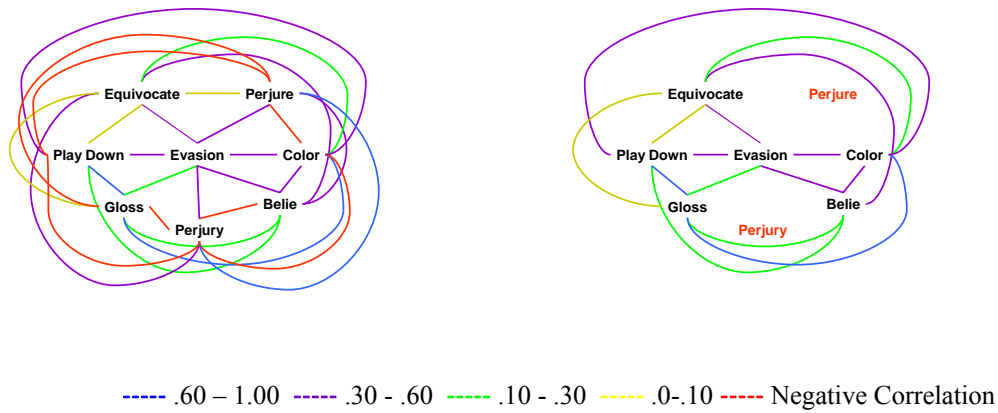


Figure 22. Left panel, correlation graph of word belongingness to the “Avoidance Lies” category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

Component 9 explained 6.13% of the variance in the ratings. The words in this category were Myth, Exaggeration, Embroider, Embellish, and Slant. Based on experts’ open-ended definitions (see Table 11), we came up with a final definition of “Lies to Impress or Enhance” for this category. Our final word list became Exaggeration, Embroider, Embellish, Slant, Warp, and Twist (see Figure 20).

Table 11. *Experts’ Open-Ended Definitions of Lies to Impress or Enhance*

Expert Definitions, “Lies to Impress or Enhance”
1. Exaggerate; weave; embellishment; recreated/historic fictions; tailored bias
2. Lie to bolster image
3. Lies to make yourself more interesting
4. To stretch the truth in order to get a certain response from an audience
5. To tell something in a way that suits your goals
6. Make larger
7. Misrepresent
8. Stretch the truth
9. To put a twist on the lie
10. Creativeness
11. Lying while telling a story
12. Lies to impress others
13. Lie to enhance

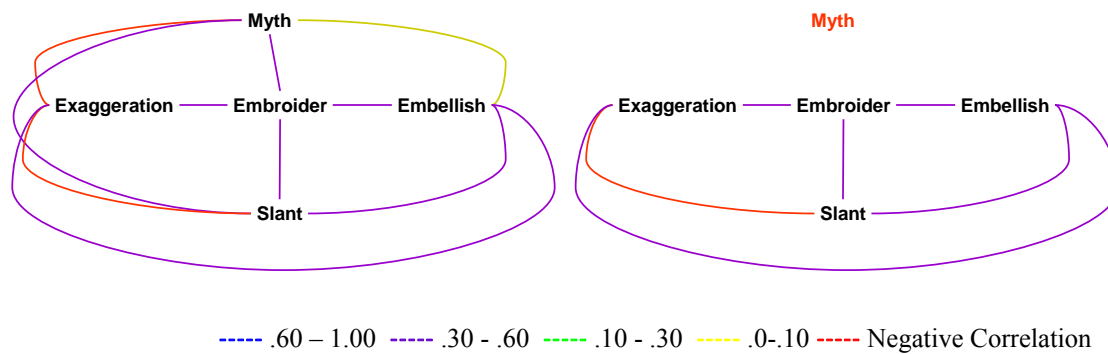


Figure 23. Left panel, correlation graph of word belongingness to the “Lies to Impress or Enhance” category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

Component 10 explained 5.74% of the variance in the ratings. The words in this category were Backbite, Detraction, Guile, and Obloquy. Based on experts’ open-ended definitions (see Table came up with a final definition of “Verbal Lies to Hurt Others” for this category. Our final word list became Backbite, Detraction, Guile, and Obloquy (see Figure 10).

Table 12. *Experts’ Open-Ended Definitions of Lies to Hurt Others*

Expert Definitions, “Lies to Hurt Others”
1. Slander; demean; treacherous; abusive
2. Lie to help self
3. Lies used to hurt others
4. A verbal comment made with malicious/nasty intent
5. Dissuade
6. Lie to hurt someone
7. Deceit
8. Lie to slander
9. To tear another person down
10. Vengeful, hurtful lies
11. Office politics
12. Lies to disparage another
13. Lie by diverting attention; or revenge

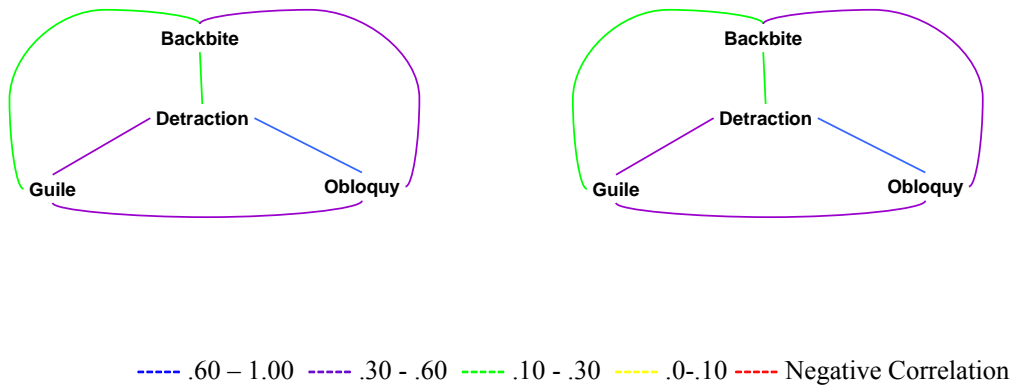


Figure 24. Left panel, correlation graph of word belongingness to the “Verbal Lies to Hurt Others” category. Center word has the largest mean intercorrelation with remaining words. Right panel, resulting correlation graph words with the weakest overall patterns of correlation removed.

All of the words in our list were uploaded into the Latent Semantic Analysis (Landauer, Foltz, & Laham, 1998) web interface in order to generate semantic distance ratings. The statistically derived patterns of the ratings mirrored our expert categories. The parallel evidence from our two procedures, the expert ratings and the LSA ratings, suggest that our categories are robust.

At this time we have developed and deployed an initial questionnaire that targets nine of the ten domains. The first component will not be used because the words are general and not specific to kinds of lies. For each domain, we plan to ask two kinds of questions. First, we plan to ask participants how often they engage in a certain kind of deception. We plan to use a Likert-type scale for this ranging from 1-4 (e.g. 1 = Rarely or None of the Time, 4 = Most or All of the Time). Second, we plan to ask participants to rate how accurate deception statements are about them. We plan to use a Likert-type scale for this ranging from 1-5 (e.g. 1 = Very Inaccurate, 5 = Very Accurate). For example, we might say, “I would deceive someone for my own personal gain” or “I would exaggerate a situation in order to gain sympathy from others.”

In order to decide which words from our final word lists to include on the questionnaire, we used the results of a previous study that asked students to rate their familiarity with words related to deception (see Appendix 1). Each word on the final questionnaire will have several definitions included with it, as well as an example of the word used in a sentence. See Appendix 2 for a list of these definitions and example sentences.

Participants for this study will be undergraduates at the University of South Carolina. In order to recruit participants, we plan to use the Psychology Department’s online participant pool. We plan to have participants fill out the questionnaire online along with demographic information and personality inventories. These will include several items from the International Personality Item Pool (Goldberg, 1999), the State-Trait Anxiety Questionnaire (Spielberger, Gorsuch, & Luchene, 1970), and the Center for Epidemiological Studies – Depression Scale (CES-D) (Radloff, 1977) .

Key Research Accomplishments

Bulleted list of key research accomplishments emanating from this research.

Reportable Outcomes

This research has resulted in the following.

1. The construction of a facility for the recording of fMRI data at the Palmetto Hospital in Columbia, SC which is used extensively by the University of South Carolina for research in the area of deception detection.
2. The Deception Detection Database, an archive of approximately 730 full text references on deception and detection of deception. This archive is password protected and currently available only to individuals at the University of South Carolina http://catdd.psych.sc.edu/JMCV_Specific/Repository/Login.php. The user interface is searchable and contains a continuously updated “Notes” section that allows users to comment on particular articles.
3. The ERP-Suite: This suite provides a graphic user interface for the simultaneous exploration of multiple data sets. This suite is currently functional as an ERP analysis system, and work will continue throughout the course of the grant to update the software. Hopes for the future are to integrate this suite with the ERP data archive.
4. The ERP data archive. This data archive is a protected data repository with a graphical user interface programmed on the .net framework utilizing a MySQL backend. The data set contains a large number of data points (approximately 1000 sub X 160 trials x 4-6 Conditions X 1000 ms X 256 samples X 128 electrodes). During the first year of the project we created a documented procedure for data storage and tested the procedure with example data sets. Data can be easily used by SAS (SAS Institute Inc.) and other software systems. During the next year we will begin populating the data set with our archived data sets. And begin several data mining projects.
5. The University of South Carolina has agreed to hire an endowed chair in Cognitive Neuroscience with extensive experience in Magnetic Resonance Imaging.
6. Presentations.

Vendemia, J. M. C. (2007, August). *Theoretical Underpinnings of Polygraph Data*. Paper presented at the Annual Meeting of the American Polygraph Association. New Orleans, LA.

An exhaustive review of central nervous system mechanisms which have been considered within the academic literature to subserve the autonomic system measures commonly associated with the polygraph. A special emphasis in this paper was given to electrodermal response within the context of Sokolov’s theory of the orienting (Sokolov, 1963). The danger of utilizing measures of deceptive behavior that explain the same sources of variability within dependent variables was also addressed.

Vendemia, J.M.C. (2007, May). *Screening Scenarios*. Invited Address, Credibility Assessment Research Summit, Washington, DC.

This talk covered the methodological characteristics of U.S. Security Screening Scenario as applied in a variety of Department of Defense contexts. A review of applicable research in the

areas of Voice Stress Analysis, pupillometry, thermal imaging, brain wave measures, fMRI, and combinatorial methodologies was provided as well as a critical assessment of the reliability, validity, and utility of each technology. Finally, a statement of future research needs was given.

Sanchez, C., Meek, S.W., Phillips, M., Craig, A., & Vendemia, J.M.C.V (2007, May). Anterior Cingulate and Prefrontal Activity as Correlates of Attention Switching and Consideration of Multiple Relations during Truthful and Deceptive Responses: A BOLD Imaging Study. Poster presented at the 12th annual meeting of the Cognitive Neuroscience Society (CNS), New York, NY.

In a study with college-aged students (N=20) using directed deceptions during a sentence verification task with two stimuli, BOLD activations in the anterior cingulate and prefrontal cortex were measured. Although general comparisons were made between truthful and deceptive responses as well as switch vs. no-switch trials two further comparisons were made to address specific hypotheses. It has been debated whether or not the anterior cingulate activity observed during fMRI studies of deception is related to attention-switching alone or to both attention-switching and conflict resolution. In the current study, deceptive switch trials were compared to no-switch trials to answer this question. Some fMRI researchers argue that the anterior prefrontal cortex, specifically Brodmann's Area 10, is involved in the act of deception. ECD models of HD-ERP data have supported this supposition (Vendemia, 2003). Ramnani and Owen (2004) argue that this area is activated when an individual must make simultaneous considerations of multiple relations. When an individual deceives, these multiple relations may occur between situational context, goal-driven behavior, divergence of the deceptive information from truthful information, and a variety of internal states. Given the generalist nature of these simultaneous considerations, it is no surprise that several researchers have identified activation in this region during the act of deception. Prefrontal activity during deceptive responding was contrasted with prefrontal activity during truthful responses in switch and no-switch conditions. The findings are discussed as they relate to early attentional mechanisms and decision making during deceptive responses.,NULL,45,Vendemia,NULL

Phillips, M., Meek, S.W., Craig, A., Sanchez, C., & Vendemia, J. M. C. (2007, May). *Event-Related Potential Correlates of Switching Between Truthful and Deceptive Responses*. Poster presented at the 12th annual meeting of the Cognitive Neuroscience Society (CNS), New York, NY.

The influence of deception and stimulus congruity on brain event-related potentials (ERP) was examined in a two-stimulus sentence verification task. In the current study, 20 college-aged participants viewed questions to which they were randomly prompted to respond with two levels of deception and congruity. The resulting ERPs were analyzed with two strategies: 1) a spatial principal components analysis, and 2) an independent components analysis. Although the ability of these two analysis techniques to recover dipoles from simulated data has been established (Richards, 2003), the current study examines the benefits and costs of these strategies in a less controlled data set. Dipole models for both solutions were calculated for components related to the early positive wave (P3a), a late positive wave (P3b), and a late anterior negativity (N4). Research using the two-stimulus paradigm, has identified distinct potentials related to each of these waveforms using standard peak analysis approaches (Vendemia et al., 2005). The dipole models were calculated using both a 4-shell and realistic head model. The comparison of these techniques and their relationship to a theory of deception that involves early and late processing is discussed

Meek, S. W., Phillips, M., Sanchez, C., Craig, A., & Vendemia, J. M. C. (2007, March). Misinformation & Deception. Poster presented at the 12th annual meeting of the Cognitive Neuroscience Society (CNS), New York, NY.

The influence of memory encoding on deceptive responses was measured across two experiments that investigated reaction times (RTs) and event-related potentials (ERPs) with 120 college-aged participants. Previous studies of deception required manipulations of information that was considered familiar knowledge for participants. The current study created participant responses that were dependent on information presented through a misinformation paradigm. In this paradigm post-event information interferes with the encoding and storage of original events. These effects are then examined during the retrieval phase. Participants were balanced across truthful and deceptive groups and asked to respond to questions related to the information presented. Data from the first study indicated when responding to misinformation participants had significantly longer reaction times ($M = 870.98$, $SE = 42.22$) than when responding to truthful information ($M = 734.52$, $SE = 26.75$, $F(1, 68) = 10.52$, $p = .002$). HD-ERPs were recorded in the response phase of the second experiment using a high-density geodesic sensory net (Electrical Geodesics, Inc), and then analyzed with principal components. The appearance of a late occurring negativity (N4) waveform, commonly related to response congruity, indicates the desired memory encoding effects. The findings are used to support the relationship between memory processing and the act of deception.

Buzan, R. F., Phillips, M., Meeks, S. W., Kirk, A., & Vendemia, J. M. C. (2007, May). *ERN as an Index of Catastrophic Response to Failure*. Poster presented at the 12th annual meeting of the Cognitive Neuroscience Society (CNS), New York, NY.

Brain event-related potentials (ERPs) were used to investigate whether the error-related negativity (ERN) can serve as an index of the 'catastrophic response to perceived failure' (Elliott et al., 1996) present in depressed individuals. Prior research has demonstrated that the error-related negativity ERP component occurs in response to perceived errors and negative feedback and may be suppressed in depressed individuals who commit consecutive errors. It may also serve as an index of the strong emotional response to negative feedback exhibited by depressed individuals. The present study served to extend these findings using a two-stimulus autobiographical deception paradigm modified to include feedback. Task difficulty was varied by manipulating the time available to respond. HD-ERPs were recorded with a High-density geodesic sensory net (Electrical Geodesics, Inc), and then analyzed using principal components.

Conclusion

We have completed the development of an fMRI laboratory to function with existing ERP Laboratory. The University of South Carolina has agreed to hire an endowed chair in Cognitive Neuroscience with extensive experience in Magnetic Resonance Imaging to assist in future research and training efforts. The laboratory has developed the strategies for data storage. However, in addition to the initial analysis strategies proposed we wish to add work with realistic head models. This analysis strategy does not require additional data acquisition, but will improve overall accuracy of our models. We continue data acquisition on paradigms designed to establish the impact of cognitive and neuropsychological variables on HD-ERP and fMRI. Our major findings over the past year suggest that switches between deceptive and truthful responses are related to specific patterns of activation that are separable from workload processes during the act of deception. We have also found that differing ratios of truthful to deceptive responding do impact the measures of deception. This finding has potential for significant application. In

the applied setting, polygraph exams are administered with variable ratios of truth to deceptive responses. Although these results are preliminary, the findings suggest that we may have identified a source of errors within detection of deception paradigms.

Finally, we continue with the development of questionnaire research related socio-cognitive variables related to deceptive behavior. Taxonomic research into deceptive behavior has suggested that dimensions such as harm and benefit can be used to separate types of deception. However, research in our lab has suggested that situational variables (such as deception duration and modality) may play much larger roles than previously thought. This research may have implications for the way in which deception paradigms are designed.

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Appendices

Appendix 1. Membership in the Data Format Working Group.

“The DFWG is charged with arriving at a technical solution to the problem of multiple data formats used in fMRI research. This was identified by many investigators as a fundamental obstacle to fMRI fulfilling the promise it has to elucidate brain function. The solution arrived at by the DFWG will not be imposed on the research community, but several groups that develop fMRI-related software have already indicated their willingness to adopt the solution. Suggestions for membership on the DFWG were broadly solicited from the research community.”

The Current DFWG members are:

Chair: Stephen C. Strother (Rotman Institute-Baycrest Centre/University of Toronto)
John Ashburner (Functional Imaging Laboratory, London, United Kingdom)
Hester Breman (Brain Innovation B.V., Maastricht, The Netherlands)
Robert W. Cox (National Institute of Mental Health, NIH, DHHS, Bethesda, Maryland)
Kate Fissell (University of Pittsburgh, Pittsburgh, Pennsylvania)
Christian Haselgrove (Massachusetts General Hospital, Charlestown, Massachusetts)
Mark Jenkinson (Oxford University Centre for Functional MRI of the Brain, United Kingdom)
David Keator (University of California, Irvine)
Peter Kochunov (University of Texas Health Science Center, San Antonio, Texas)
Daniel Valentino (University of California, Los Angeles)
Bennet Vance (Dartmouth College, Hanover, New Hampshire)
Robert Vincent (Montreal Neurological Institute, Montreal, Canada)
ex officio: Michael F. Huerta (National Institute of Mental Health, NIH, DHHS)
ex officio: Yuan Liu (National Institute of Neurological Disorders and Stroke, NIH, DHHS)

Past Members Include:

Colin J. Holmes (Silicon Graphics, Inc., Mountain View, California)
Jack Lancaster (University of Texas Health Science Center, San Antonio, Texas)
David E. Rex (University of California, Los Angeles)
Stephen M. Smith (Oxford University Centre for Functional MRI of the Brain, United Kingdom)
Jeffrey B. Woodward (Dartmouth College, Hanover, New Hampshire)

Appendix 2. Student Ratings of the familiarity of words related to deception (N=84, Women = 58, Men = 26; Mean Age = 20.01, Stdev = 2.32). Lower ratings correspond to higher familiarity.

aspersion	5.36 (2.26)	Dupe	3.27 (2.57)	hypocrisy	1.92 (1.74)	Prevaricate	5.59 (2.66)
backbite	5.12 (2.53)	Duplicity	3.60 (2.40)	Innaccuracy	1.55 (1.30)	Profane	2.86 (2.25)
be untruthful	1.78 (1.76)	Embellish	2.00 (1.71)	Invent	1.74 (1.51)	Profess	3.01 (2.29)
bear false witness	2.18 (2.01)	Embroider	3.55 (2.57)	Juggle	3.58 (2.41)	Put on	2.13 (1.88)
Beguile	4.32 (2.46)	Equivocate	4.69 (2.59)	Libel	3.61 (2.79)	Put up a front	2.07 (1.72)
Belie	5.55 (2.51)	Evasion	3.12 (2.35)	Lie	1.35 (1.17)	queer	2.54 (2.10)
Break promise	1.62 (1.60)	Exaggeration	1.55 (1.31)	Make believe	1.47 (1.43)	sell down	4.68 (2.85)
bull	3.33 (2.57)	Fable	1.79 (1.62)	Malign	4.20 (2.63)	the river	7.13 (2.13)
Bunk	5.00 (2.74)	Fabricate	1.62 (0.97)	Mendacity	5.89 (2.55)	simulacrum	2.86 (2.19)
calumniate	6.21 (2.34)	Fake	1.60 (1.52)	Mislead	1.52 (1.31)	simulate	1.68 (1.50)
cant	5.34 (2.85)	Falsehood	1.82 (1.33)	Misrepresent	1.65 (1.60)	slander	3.01 (2.28)
casuistry	6.98 (2.25)	Falsify	1.76 (1.39)	Mock	1.55 (1.19)	slant	2.96 (2.24)
color	3.21 (2.26)	Fasity	2.78 (2.23)	Myth	1.53 (1.39)	smear	4.13 (2.76)
con	1.82 (1.61)	Feign	3.95 (2.83)	Obloquy	6.84 (2.40)	snow	5.02 (2.87)
concoct	3.63 (2.66)	Fib	1.43 (1.19)	Obscure	2.33 (1.93)	softsoap	2.76 (2.35)
counterfeit	1.59 (1.45)	Fiction	1.44 (1.20)	Overdraw	3.93 (2.54)	string along	5.95 (2.78)
deceit	1.55 (1.22)	Forgery	1.49 (1.37)	Pad	3.95 (2.84)	subterfuge	1.82 (1.57)
deceive	1.53 (1.46)	Forswear	4.71 (2.52)	Palter	6.26 (2.29)	tale	1.87 (1.53)
deception	1.52 (1.27)	Fraudulent	1.96 (1.75)	Perjure	3.56 (2.72)	Tall story	2.25 (1.84)
Defame	3.15 (2.41)	Frame	1.99 (1.98)	Perjury	2.47 (2.31)	twist	2.10 (1.89)
Delude	4.02 (2.31)	Fraud	1.56 (1.44)	Pervert	1.84 (1.59)	victimize	4.76 (2.87)
Detraction	4.24 (2.46)	Fudge	2.62 (2.37)	Phony	1.66 (1.73)	vilify	1.42 (1.29)
Dishonesty	1.48 (1.39)	Garbel	4.86 (2.67)	Plagiarize	1.55 (1.49)	white lie	3.66 (2.57)
Disinformation	2.68 (2.15)	Gloss	3.58 (2.43)	Plant	2.80 (2.29)	whitewash	3.20 (2.66)
Dissemble	3.79 (2.51)	Go back on	2.14 (1.90)	Play down	2.36 (1.84)	whopper	5.64 (2.47)
Dissimulate	4.68 (2.34)	Guile	4.02 (2.38)	Pose	2.28 (1.88)	wile	2.95 (2.39)
Distort	2.06 (1.73)	Hoax	1.88 (1.68)	Pretend	1.40 (1.08)	wrap	
Distortion	2.06 (1.92)	Hyperbole	2.99 (2.50)	Pretense	2.80 (2.01)		

Definitions and example sentences for deception words.

Words	Definitions						
	American	Oxford	Encarta	Cambridge	Webster	Wordsmyth	Ultralingua
<u>Aspersions</u>	An unfavorable or damaging remark; slander; The act of defaming or slandering	an attack on someone's character or reputation	a statement that attacks somebody's character or reputation; the making of defamatory remarks		a false or misleading charge meant to harm someone's reputation; the act of making such a charge	an insulting or malicious remark about someone; derogation; slander	A disparaging remark; The act of defaming
<u>backbite</u>	To speak spitefully or slanderously about (another)		to say mean or spiteful things about (as one not present)	to make spiteful or slanderous comments about somebody who is not present	to criticize harshly or speak badly of (an absent person)	To say mean things	
<u>be untruthful</u>	1. Contrary to truth. 2. Given to falsehood; mendacious		not containing or telling the truth	lying or failing to tell the truth; not in accordance with the facts or what is known	contrary to fact; not true; false	Not expressing or given to expressing the truth	not truthful
<u>bear false witness</u>		to lie					
<u>Beguile</u>	To deceive by guile; delude	charm, enchant, or trick	to mislead or deceive somebody	to charm, attract or interest, sometimes in order to deceive	to lead by deception; hoodwink; to engage the interest of by or as if by guile	to deceive or cheat by using guile;	To delude by guile, artifice, or craft; to deceive or impose on, as by a false statement; to lure
<u>belie</u>	To picture falsely; misrepresent	to show something to be false, or to hide something such as an emotion	to give a false impression of; to present an appearance not in agreement with; disguise	to disguise the true nature of something; to show that something is not true or real	to give a false impression of; to reveal the falseness of; contradict	To show to be false; to convict of, or charge with, falsehood; To give a false representation or account of; To tell lie about; to calumniate; to slander; To mimic; to counterfeit; To fill with lies.	fail to give a true idea of; show to be untrue or unjustified
<u>Break Promise</u>				to not do what you said that you would do			Failure to keep a promise
<u>Bull</u>	Foolish, deceitful, or boastful language; Insolent talk or behavior.	nonsense		complete nonsense or something that is not true	empty boastful talk; nonsense; to fool especially by fast boastful talk; to engage in idle and boastful talk		
<u>Bunk</u>	Empty talk; nonsense	nonsense	talk or writing dismissed as nonsensical or inaccurate	complete nonsense or something that is not true	nonsense	nonsense	

<u>Calumnia</u> <u>te</u>	To make maliciously or knowingly false statements about	make false and defamatory statements about	to accuse somebody falsely, or slander somebody		to utter maliciously false statements, charges, or imputations about; to injure the reputation of by calumny	to make harmful and false statements about (someone)	
<u>camoufla</u> <u>ge</u>	1. To conceal by the use of disguise or by protective coloring or garments that blend in with the surrounding environment. 2. To conceal, usually through misrepresentati on or other artifice	the use of leaves, branches, paints and clothes for hiding soldiers or military equipment so that they look part of their surroundings; something that is meant to hide something, or behavior that is intended to hide the truth	the disguising especially of military equipment or installations with paint, nets, or foliage; concealment by means of disguise; behavior or artifice designed to deceive or hide; to conceal or disguise by camouflage	concealment of things, especially troops and military equipment, by disguising them to look like their surroundings, e.g. by covering them with branches or leaf-clad netting; devices designed to conceal by imitating the colors of the surrounding environment; something that is intended to hide, disguise, or mislead; to conceal something by making it match its surroundings, especially in appearance; to disguise something in order to mislead somebody, often somebody perceived as a threat	a method of concealing something such as a person, vehicle, or building, esp. from an enemy military force, by covering it or coloring it so as to imitate its surroundings; a method of concealing something such as a person, vehicle, or building, esp. from an enemy military force, by covering it or coloring it so as to imitate its surroundings; to conceal by coloring or covering to imitate the surroundings; to conceal by disguising	Device or stratagem for concealment or deceit; To disguise by camouflaging; exploit the natural surroundings to disguise something	the disguising of military personnel and equipment by painting or covering them to make them blend in with their surroundings; hide or disguise by means of camouflage
<u>Cant</u>	Hypocritically pious language	hypocritical and sanctimonious talk; talk hypocritically and sanctimoniously	insincere talk, especially regarding morals or religion	statements on especially religious or moral subjects which are not sincerely believed by the person making them	to talk hypocritically ; the insincere use of pious words	insincere statements made to give one the appearance of goodness, piety, or the like; to use solemn language hypocritically to gain a good reputation;	Insincere talk about religion or morals
<u>casuistry</u>	Specious or excessively subtle reasoning intended to rationalize or mislead.	the use of clever arguments to trick people	Specious argument	misleadingly subtle reasoning: the use of subtle, sophisticated, and sometimes deceptive argument and reasoning, especially on moral issues, in order to justify something or mislead somebody	the fallacious misleading, or dishonest application of ethical principles; sophistry	Argumentation that is specious or excessively subtle and intended to be misleading	The use of clever but false reasoning, especially in relation to moral issues

<u>Color</u>	To misrepresent, especially by distortion or exaggeration; To gloss over; excuse		to influence an opinion or judgment, especially so as to make it less objective		misrepresent; distort; gloss; excuse	to alter the tone or character of; to misrepresent	To distort; To gloss or excuse; To modify or bias
<u>Con</u>		deceive (someone) into doing or believing something by lying; a deception of this kind	to cheat somebody dishonestly, usually out of money or property, by first convincing the victim of something that is untrue; to tell somebody something untrue or misleading	to make someone believe something false, usually so that they will give you their money or possessions; a trick to get someone's money, or make them do what you want	swindle; something (as a ruse) used deceptively to gain another's confidence	pertaining to trickery or deception that involves an abuse of confidence; to cheat by trickery; swindle	To fool or dupe
<u>concoct</u>	To devise, using skill and intelligence; contrive: <i>concoct a mystery story.</i>	to invent an excuse, explanation or story in order to deceive someone	devise; fabricate	to think up a story or plan, especially something imaginative, that is intended to be deceitful or misleading	to make untruthfully or evasively; invent; contrive		invent or devise (a story or plan)
<u>Counterfe</u> <u>it</u>	To make a copy of, usually with the intent to defraud; forge; To make a pretense of; feign; To carry on a deception; dissemble; To make fraudulent copies of something valuable; Made in imitation of what is genuine with the intent to defraud; Simulated; feigned; A fraudulent imitation or facsimile	made in exact imitation of something valuable with the intention to deceive or defraud; a forgery; imitate fraudulently; pretend to feel or possess (an emotion or quality)	made as a copy of something, especially money, in order to defraud or deceive people; pretended in order to deceive somebody; to make realistic copies of something, especially money, in order to defraud or deceive people; to pretend to have an emotion in order to deceive somebody	made to look like the original of something, usually for dishonest or illegal purposes	made in imitation of something else with intent to deceive; insincere; feigned; imitation; to try to deceive by pretense or dissembling; to engage in counterfeiting something of value; to make a fraudulent replica of; to imitate or feign especially with intent to deceive; forgery	made to resemble something genuine in order to defraud; feigned or insincere; something made to resemble a genuine object in order to defraud; forgery; to make a fraudulent imitation or copy of; to feign or pretend; to make fraudulent imitations or copies; to feign an emotion or attitude	
<u>deceit</u>	1. The act or practice of deceiving; deception. 2. A stratagem; a trick. 3. The quality of being deceitful; falseness.	(an act of) keeping the truth hidden, especially to get an advantage	the act or practice of deceiving; an attempt or device to deceive; the quality of being deceitful	the act or practice of deceiving or misleading somebody; something that is done to deceive or mislead somebody	the act or practice of misleading, tricking, or cheating; a means of misleading, tricking, or cheating; trick; stratagem; the quality of being misleading and deceptive;	An attempt or disposition to deceive or lead into error; any declaration, artifice, or practice, which misleads another, or causes him to believe what is false; a contrivance to entrap; deception; a wily device;	the action or practice of deceiving; a deceitful act or statement.

					falsehood	fraud; Any trick, collusion, contrivance, false representation, or underhand practice, used to defraud another. When injury is thereby effected, an action of deceit;	
<u>deceive</u>	1. To cause to believe what is not true; mislead.	to persuade someone that something false is the truth; to keep the truth hidden from someone for your own advantage; to trick; to refuse to accept the truth	to be false to; to fail to fulfill; cheat; to cause to accept as true or valid what is false or invalid; ensnare	to mislead or deliberately hide the truth from somebody; to convince yourself of something that is not true	to mislead (a person) to believe something that is untrue; trick; defraud; to engage in misleading; act or speak untruthfully	To be false to; be dishonest with; To cause someone to believe an untruth	deliberately mislead into believing something false; (of a thing) give a mistaken impression
<u>deception</u>	1. The use of deceit. 2. The fact or state of being deceived. 3. A ruse; a trick.	when people hide the truth, especially to get an advantage	the act of deceiving; the fact of condition of being deceived; something that deceives; trick	the practice of deliberately making somebody believe things that are not true; an act, trick, or device intended to deceive or mislead somebody	the act of causing someone to believe an untruth, or the state of being so deceived; the means of causing someone to be deceived; trick; lie; fraud	The act of deceiving	the action of deceiving; a thing that deceives
<u>Defame</u>	To damage the reputation, character, or good name of by slander or libel	damage the good reputation of	to attack somebody or somebody's reputation, character, or good name by making slanderous or libelous statements	to damage the reputation of a person or group by saying or writing bad things about them which are not true	to harm the reputation of by libel or slander	to damage or destroy the reputation of by slander or libel; speak ill of unfairly	To charge falsely or with malicious intent; attack the good name and reputation of someone
<u>Delude</u>	To deceive the mind or judgment of	persuade (someone) to believe something incorrect; mislead	to persuade somebody to believe something that is untrue or unreal	to make someone believe something that is not true; to deceive	to mislead the mind or judgment of; deceive; trick	to cause to hold a false belief; mislead; deceive	To lead from truth or into error; to mislead the mind or judgment of to beguile; to impose on; to dupe; to make a fool of
<u>detract</u>	2. A derogatory or damaging comment on a person's character or reputation; disparagement		a lessening of reputation or esteem especially by envious, malicious, or petty criticism; belittling; disparagement	the act of damaging somebody's reputation, especially by making discrediting comments		A petty disparagement	

<u>dishonest</u> y	1. Lack of honesty or integrity; improbity. 2. A dishonest act or statement.	state of being not honest	lack of honesty or integrity; disposition to defraud or deceive; a dishonest act; fraud	the use of lies or deceit, or the tendency to be deceitful; a dishonest act	the inclination to lie, steal, or cheat; lack of honesty; an act of lying, stealing, cheating, or the like	Lack of honesty; acts of lying or cheating or stealing; The quality of being dishonest	
<u>disinformation</u>	1. Deliberately misleading information announced publicly or leaked by a government or especially by an intelligence agency in order to influence public opinion or the government in another nation	false information spread in order to deceive people	false information deliberately and often covertly spread (as by the planting of rumors) in order to influence public opinion or obscure the truth	false or deliberately misleading information, often put out as propaganda			information which is intended to mislead
<u>dissemble</u>	To disguise or conceal one's real nature, motives, or feelings behind a false appearance.	to hide your real intentions and feelings or the facts	to hide under a false appearance, conceal facts, intentions, or feelings under some pretense			To hide under a false appearance	
<u>dissimulation</u>	To disguise (one's intentions, for example) under a feigned appearance. To conceal one's true feelings or intentions.		to hide under a false appearance			concealment, secretiveness	
<u>Distort</u>	To give a false or misleading account of; misrepresent.	give a misleading account of	to describe or report something in an inaccurate or misleading way	to change something from its usual, original, natural or intended meaning, condition or shape	to twist out of the true meaning or proportion; pervert	to falsify or misrepresent; synonym: doctor	
<u>Dupe</u>	An easily deceived person; To deceive (an unwary person)	deceive; trick; a victim of deception	to persuade or induce somebody to do something by trickery or deception	to deceive someone, usually making them do something they did not intend to do; someone who has been tricked		a gullible person; one who can be readily misled or fooled; someone who is tricked or manipulated into serving the interests of another person, group, or cause; to fool or trick; mislead	One who has been deceived or who is easily deceived; To deceive; to trick
<u>Duplicity</u>	Deliberate deceptiveness in behavior or speech; An instance of deliberate deceptiveness; double-dealing	deceitfulness	the fact of being deceptive, dishonest, or misleading	lack of honesty, especially by saying different things to two people	contradictory doubleness of thought, speech, or action; especially the belying of one's true intentions by deceptive words or action	deceitful speech or action	Acting in bad faith; deception by pretending to entertain one set of intentions while acting under the influence of another

<u>Embellish</u>	To add ornamental or fictitious details to	add extra details to (a story or account) for interest	to make an account or description more interesting by inventing or exaggerating details	to make something more beautiful or interesting by adding something to it	to heighten the attractiveness of by adding decorative or fanciful details	to enhance (a story or the like) with unnecessary or fictitious details	
<u>embroider</u>	To add embellishments or fanciful details to	to make a story more entertaining by adding imaginary details to it	to elaborate on; embellish	to add exaggerated or fictitious details to an account of something to make it more interesting	to elaborate or embellish, esp. with fictitious details	To add details to	add fictitious or exaggerated details to
<u>equivocate</u>	1. To use equivocal language intentionally. 2. To avoid making an explicit statement.	to speak in a way that is intentionally unclear and confusing to other people, especially to hide the truth;	to use equivocal language especially with intent to deceive; to avoid committing oneself in what one says	to speak vaguely or ambiguously, especially in order to mislead	to express oneself ambiguously, often to avoid giving a direct answer or to deceive.	To be deliberately ambiguous or unclear in order to mislead or withhold information	
<u>evasion</u>	The act or an instance of evading. A subterfuge.	when you avoid something or someone	a means of evading; dodge; the act or an instance of evading; escape	avoidance of something unpleasant, especially a moral or legal obligation; a means of escaping or avoiding something, especially one that involves cunning or deceit; failure to give a direct answer to a direct question, usually in order to conceal the truth	the act or an instance of escaping, avoiding, or failing to perform something; the avoidance of giving a full or truthful response to a question, point of argument, or the like; a means of avoiding, escaping, or otherwise evading; ruse	A statement that is not literally false but that cleverly avoids an unpleasant truth; Nonperformance of something distasteful (<i>as by deceit or trickery</i>) that one is supposed to do	
<u>exaggeration</u>	To represent as greater than is actually the case; overstate	when someone makes something seem larger, more important, better or worse than it really is	to enlarge beyond bounds or the truth; overstate; to enlarge or increase especially beyond the normal; overemphasize	to state that something is better, worse, larger, more common, or more important than is true or usual	the act or an instance of exaggerating; overstatement	Making to seem more important than it really is	
<u>Fable</u>	A falsehood; a lie.	myth and legend	a false or improbable account of something	a short story which tells a general truth or is only partly based on fact, or literature of this type	a fictitious narrative or statement; to talk or write about as if true	a fictitious story based on legend or myth; a false account; lie; to describe or recount as though true	To feign; to invent; to devise, and speak of, as true or real; to tell of falsely; To compose fables; hence, to write or speak fiction; to write or utter what is not true.

<u>fabricate</u>	To concoct in order to deceive.	to invent or produce something false in order to deceive	to make up for the purpose of deception; invent; create	to make up something that is not true; to falsify something such as a signature or document	to invent with the intention of deceiving; make up	To make up something artificial or untrue	invent, typically with deceitful intent
<u>Fake</u>	Having a false or misleading appearance; fraudulent; One that is not authentic or genuine; a sham; A brief feint or aborted change of direction intended to mislead one's opponent or the opposing team; To contrive and present as genuine; counterfeit; To simulate; feign; To improvise (a passage); To deceive (an opponent) with a fake; To engage in feigning, simulation, or other deceptive activity; To perform a fake.	not genuine; counterfeit; a person or thing that is not genuine; forge or counterfeit; pretend to feel or suffer from (an emotion or illness)	a person or thing that appears or is presented as being genuine but is not; a move made by a player in an attempt to mislead a sports opponent about the player's intended play; not genuine, but meant to be taken for genuine; to make or produce something and claim it is genuine when it is not; to pretend to have, feel, or know something; to perform a move in an attempt to mislead a sports opponent; to improvise or ad-lib a piece of music or lines in a play during a performance	an object which is made to look real or valuable in order to deceive people; someone who is not what or whom they say they are; not real, but made to look or seem real; to make an object look real or valuable in order to deceive people; to pretend that you have a feeling or illness	counterfeit; sham; one that is not what it purports to be; a worthless imitation passed off as genuine; impostor; a simulated movement in a sports contest (as a pretended kick, pass, or jump or a quick movement in one direction before going in another) designed to deceive an opponent; a device or apparatus used by a magician to achieve the illusion of magic in a trick; to alter, manipulate, or treat so as to give a spuriously genuine appearance to; counterfeit; simulate; concoct; to deceive (an opponent) in a sports contest by means of a fake; improvise; adlib; pretend	to create a counterfeit of; falsify; to pretend or simulate; to pretend an emotion, condition, or ability; in sports, to execute a misleading maneuver; feint; anything that is not genuine or authentic; a person who pretends to feel, be, or be capable of something; faker; in sports, a misleading maneuver; not genuine or authentic; deceptive in appearance	Something false; not what it seems to be; Not genuine or real; being an imitation of the genuine article; To cheat; to swindle; to steal; to rob; To make a feint; to make an evasive maneuver; To manipulate fraudulently or falsify, so as to make an object appear better or other than it really is
<u>Falsehood</u>	1. An untrue statement; a lie. 2. The practice of lying. 3. Lack of conformity to truth or fact; inaccuracy.	lying; a lie or a statement which is not correct	an untrue statement; lie; absence of truth or accuracy; the practice of lying; mendacity	an intentionally untrue statement; the act of spreading lies; something that does not correspond with the known or observable facts	a lie or untruth; something that is false, such as an idea or opinion; the act of behaving or speaking falsely	A false statement	the state of being untrue; a lie.

<u>Falsify</u>	To state untruthfully; misrepresent; To make false by altering or adding to; To counterfeit; forge	alter (information or evidence) so as to mislead	to alter something in order to deceive; to misrepresent the facts in order to mislead	to change something, such as a document, in order to deceive people	to make false; to make false by mutilation or addition; to represent falsely	to make, or alter so as to make, untrue or inaccurate; to make a false representation of; misrepresent; to make a false representation of; misrepresent	To alter knowingly, usually to conceal the truth; To make false by mutilation or addition; as of a message or story
<u>falsify</u>	1. To state untruthfully; misrepresent. 2a. To make false by altering or adding to: <i>falsify testimony</i> . b. To counterfeit; forge: <i>falsify a visa</i> .	*see definitions in group 4*					
<u>feign</u>	a. To give a false appearance of: <i>feign sleep</i> . b. To represent falsely; pretend to: <i>feign authorship of a novel</i> . 2. To imitate so as to deceive: <i>feign another's voice</i> . 3. To fabricate: <i>feigned an excuse</i> .	to pretend to feel something, usually an emotion	to give a false appearance of : induce as a false impression; to assert as if true; pretend; invent; imagine; to give fictional representation to	to make a show or pretense of something; to make up or fabricate something; to imitate or copy somebody or something	to imitate in order to deceive; put on or give a false appearance of; to misrepresent or pretend to; to pretend	To make believe	
<u>Fib</u>	An insignificant or childish lie	a trivial lie; tell a fib	an insignificant or harmless lie; to tell an insignificant or harmless lie	to tell an unimportant and harmless lie, sometimes in a playful way	a trivial or childish lie; to tell a fib	a trivial or unimportant lie; to tell a fib	A trivial lie; To tell a relatively insignificant lie
<u>fiction</u>	Something untrue that is intentionally represented as true by the narrator.	a false report or statement which you pretend is true	something invented by the imagination or feigned	something that is untrue and has been made up to deceive people	an invention, fabrication, or falsehood		
<u>Forgery</u>	The act of forging, especially the illegal production of something counterfeit; Something counterfeit, forged, or fraudulent	the action of forging a banknote, work of art, signature, etc.; a forged or copied item	the act of making or producing an illegal copy of something so that it looks genuine, usually for financial gain; an illegal copy of something such as a document or painting that has been made to look genuine	an illegal copy of a document, painting, etc. or the crime of making such illegal copies	something forged; the crime of falsely and fraudulently making or altering a document (as a check)	the act of forging, esp. something fraudulently imitated; that which is forged	Criminal falsification by making or altering an instrument with intent to defraud
<u>Forswear</u>	To swear falsely; commit perjury	commit perjury	to be guilty of giving false evidence under oath		to make a liar of (oneself) under or as if under oath	to swear falsely under oath; perjure oneself	

<u>Frame</u>	To prearrange (a contest) so as to ensure a desired fraudulent outcome	produce false incriminating evidence against (an innocent person)	to make an innocent person appear guilty, e.g. by forging incriminating evidence	to make a person seem to be guilty of a crime when they are not by producing facts or information which are not true	to devise falsely (as a criminal charge); to contrive the evidence against (an innocent person) so that a verdict of guilty is assured	to contrive to lay blame on (someone) unjustly	
<u>Fraud</u>	A deception deliberately practiced in order to secure unfair or unlawful gain; A piece of trickery; a trick; One that defrauds; a cheat; One who assumes a false pose; an impostor	wrongful or criminal deception intended to result in financial or personal gain; a person intending or thing intended to deceive.	the crime of obtaining money or some other benefit by deliberate deception; somebody who deliberately deceives somebody else, usually for financial gain; something that is intended to deceive people	someone or something that deceives people by claiming to be someone or something that they are not	intentional perversion of truth in order to induce another to part with something of value or to surrender a legal right; an act of deceiving or misrepresenting; a person who is not what he or she pretends to be: impostor; one who defrauds: cheat; one that is not what it seems or is represented to be	deliberate deception or trickery used for unfair or illegal advantage; any act of deceit or cheating; one who uses deceit or trickery to gain advantage; cheat; impostor	Deliberate trickery intended to gain an advantage; Intentional deception resulting in injury to another person
<u>Fraudulent</u>	Engaging in fraud; deceitful; Characterized by, constituting, or gained by fraud	done by or involving fraud; deceitful or dishonest	not honest, true, or fair, and intended to deceive people	intended to deceive	characterized by, based on, or done by fraud; deceitful	using or inclined to use deceit or trickery; characterized by or based on the use of deceit or trickery	Using fraud; tricky; deceitful; dishonest; Characterized by, founded on, or proceeding from, fraud
<u>Fudge</u>	1. To fake or falsify: <i>fudge casualty figures</i> . 2. To evade (an issue, for example); dodge. 2a. To go beyond the proper limits of something: fudged on the building code requirements. b. To act dishonestly; cheat.	to avoid making a decision or giving a clear answer about something	to devise as a substitute; fake; falsify; to exceed the proper bounds or limits of something; dodge; to exceed the proper bounds or limits of something; cheat; to avoid commitment; hedge	to fiddle with or otherwise alter something in order to deceive or remain noncommittal	to tamper with, so as to obtain a desired result; to resort to tampering or cheating so as to obtain a desired result; to avoid a question or an issue; be evasive	to fake or falsify	
<u>Garble</u>	To mix up or distort to such an extent as to make misleading or incomprehensible	reproduce (a message or transmission) in a confused and distorted way	to confuse a message or information so that it is misleading or unintelligible		to so alter or distort as to create a wrong impression or change the meaning	to mix up, distort, or confuse (a message, translation, or the like); cause to be disordered or unintelligible.	To mix up and confuse; to distort

<u>gloss</u>	To make attractive or acceptable by deception or superficial treatment.	to avoid considering something, such as an embarrassing mistake, to make it seem unimportant, and to quickly continue talking about something else	to mask the true nature of : give a deceptively attractive appearance to	to intentionally leave out negative information, or treat something superficially, in order to make it appear more attractive or acceptable	to give a falsely appealing or acceptable appearance to (usu. fol. by over)	To treat hurriedly or avoid dealing with properly	try to conceal or pass over by mentioning briefly or misleadingly.
<u>go back on</u>			abandon; betray; fail	to have a change of mind about something previously agreed or promised			
<u>guile</u>	Treacherous cunning; skillful deceit	clever but sometimes dishonest behaviour that you use to deceive someone	deceitful cunning; duplicity	a cunning, deceitful, or treacherous quality	deceitfulness, treachery, or cunning; wiliness	Deceitful cunning; artifice; duplicity; wile; treachery	sly or cunning intelligence
<u>Hoax</u>	An act intended to deceive or trick; Something that has been established or accepted by fraudulent means; To deceive or cheat by using a hoax	a humorous or malicious deception; deceive with a hoax	an act intended to trick people into believing something is real when it is not; to trick people into believing something is real when it is not	a plan to deceive someone, such as telling the police there is a bomb somewhere when there is not one, or a trick; to deceive, especially by playing a trick on someone	to trick into believing or accepting as genuine something false and often preposterous; an act intended to trick or dupe; something accepted or established by fraud or fabrication	an act of deception, esp. a humorous or mischievous trick; something false or inauthentic presented as true or authentic, with intent to deceive or defraud; to deceive or defraud with a hoax	A deception; a deceptive trick or story; an elaborate practical joke; To play a joke on or subject to a hoax
<u>Hyperbole</u>	A figure of speech in which exaggeration is used for emphasis or effect	deliberate exaggeration, not meant to be taken literally	deliberate and obvious exaggeration used for effect, e.g. "I could eat a million of these"	a way of speaking or writing that makes someone or something sound bigger, better, more, etc. than they are	extravagant exaggeration	in rhetoric, an obvious and deliberate exaggeration or overstatement, intended for effect and not to be taken literally, such as "He had a million excuses"	Extravagant exaggeration
<u>Hypocrisy</u>	The practice of professing beliefs, feelings, or virtues that one does not hold or possess; falseness	the practice of claiming to have higher standards or beliefs than is the case	the false claim to or pretense of having admirable principles, beliefs, or feelings	when someone pretends to believe something that they do not really believe or that is the opposite of what they do or say at another time	a feigning to be what one is not or to believe what one does not; <i>especially</i> : the false assumption of an appearance of virtue or religion	the practice or an instance of stating or pretending to hold beliefs or principles that one does not actually live by; insincerity	An expression of agreement that is not supported by real conviction; Insincerity by virtue of pretending to have qualities or beliefs that one does not really have
<u>invent</u>	To make up; fabricate	to create a reason, excuse, story etc. which is not true, usually to deceive someone	to devise by thinking; fabricate	to make up something false such as a false excuse	to think up or fabricate (something false or fictitious).	to come up with	make up (a false story, name, etc.)

<u>Juggle</u>	Trickery for a dishonest end; To manipulate in order to deceive; To use trickery; practice deception	misrepresent (facts)	to manipulate data in order to deceive	to change results or information recorded as numbers so that a situation seems to be better than it really is	to practice deceit or trickery on; beguile; to manipulate or rearrange especially in order to achieve a desired end	to alter or manipulate for the purpose of deception	The act of rearranging things to give a misleading impression; To manipulate the figures of an account, for example, so as to hide a deficit
<u>Libel</u>	A false publication, as in writing, print, signs, or pictures, that damages a person's reputation; The act of presenting such material to the public; To publish a libel about (a person)	the publication of a false statement that is damaging to a person's reputation; a written defamation; defame by publishing a libel	a false and malicious published statement that damages somebody's reputation. Libel can include pictures and any other representations that have public or permanent form; the making of false and damaging statements about somebody; to publish false and malicious statements about somebody that damage his or her reputation; to give a false and damaging account of somebody	a piece of writing which contains bad and false things about a person	a written or oral defamatory statement or representation that conveys an unjustly unfavorable impression; a statement or representation published without just cause and tending to expose another to public contempt; defamation of a person by written or representational means; to make libelous statements; to make or publish a libel against	in law, written or printed matter that is false, damages a person's reputation or material well-being, and arises from malice or extreme negligence; any material that maliciously or falsely defames a person; in law, to make or publish libelous material about (someone); to defame maliciously or harmfully	tort consisting of false and malicious publication printed for the purpose of defaming a living person; To make slanderous statements against
<u>lie</u>	1. To present false information with the intention of deceiving. 2. To convey a false image or impression	to say or write something which is not true in order to deceive someone; something that you say which you know is not true	to make an untrue statement with intent to deceive; to create a false or misleading impression; an assertion of something known or believed by the speaker to be untrue with intent to deceive; an untrue or inaccurate statement that may or may not be believed true by the speaker; something that misleads or deceives; a charge of lying	to say something that is not true in a conscious effort to deceive somebody; to give a false impression; a false statement made deliberately; a situation based on deception or a false impression	an untrue statement made on purpose; intentional falsehood; something intended to deceive or mislead; to make a false statement intentionally; to give a false or inaccurate impression; mislead; deceive	A statement that deviates from or perverts the truth; To tell an untruth; pretend with intent to deceive	an intentionally false statement; a situation involving deception or founded on a mistaken impression; tell a lie or lies; (of a thing) present a false impression

<u>Make Believe</u>	Playful or fanciful pretense	a state of fantasy or pretence; imitating something real; pretend	imaginary situations or events that somebody, especially a child playing, pretends are true	believing in things that you want to believe because they are easy or exciting, but which are not real	a pretending that what is not real is real; imaginary; pretended	invention; pretending; pretended; imaginary	The enactment of a pretense; Imagined as in a play; "the make-believe world of theater"
<u>Malign</u>	To make evil, harmful, and often untrue statements about; speak evil of	speak ill of	to criticize somebody or something in a spiteful and false or misleading way	to say false and unpleasant things about someone or to unfairly criticize them	to utter injuriously misleading or false reports about	to speak badly of; defame; slander	To speak ill of, to defame
<u>Mendacity</u>	The condition of being mendacious; untruthfulness; A lie; a falsehood		deliberate untruthfulness ; a lie or falsehood	not truthful	the quality or state of being mendacious; lie	a tendency to lie; untruthfulness; an instance of untruth; lie	The tendency to be untruthful.
<u>mislead</u>	1. To lead in the wrong direction. 2. To lead into error of thought or action, especially by intentionally deceiving.	to cause someone to believe something that is not true	to lead in a wrong direction or into a mistaken action or belief often by deliberate deceit; to lead astray : give a wrong impression	to cause somebody to make a mistake or form a false opinion or belief, either by employing deliberate deception or by supplying incorrect information; to be responsible for making somebody, especially somebody younger, do wrong or adopt bad habits	to guide in a wrong direction; to cause to think or act wrongly	To lead someone in the wrong direction	
<u>Misrepresentation</u>	To give an incorrect or misleading representation of; To serve incorrectly or dishonestly as an official representative of	give a false or misleading account of	to give an inaccurate or deliberately false account of the nature of somebody or something; not to be truly or typically representative of somebody or something	to describe falsely an idea, opinion or situation or the opinions of someone, often in order to obtain an advantage	to give a false or misleading representation of usually with an intent to deceive or be unfair	to identify or describe in a misleading way; to represent wrongly or falsely while acting as an official agent of	To represent falsely
<u>Mock</u>	To imitate; counterfeit; An imitation or a counterfeit; Simulated; false; sham; In an insincere or pretending manner	mimic contemptuously; not authentic or real	to imitate somebody in a way that is intended to make that person appear silly or ridiculous; made to appear like something else, usually something older or more expensive; something made as an imitation	not real but appearing or pretending to be exactly like something; intended to seem real; artificial or pretended	to imitate (as a mannerism) closely; an act of imitation; something made as an imitation; of, relating to, or having the character of an imitation; in an insincere or counterfeit manner	to make fun of by imitating in action or speech; mimic; to imitate; an imitation, simulation, or counterfeit; not genuine or true; simulated; counterfeit; sham;	Imitation; mimicry; Constituting a copy or imitation of something; To imitate with mockery and derision

<u>Myth</u>	A fiction or half-truth, especially one that forms part of an ideology; A fictitious story, person, or thing.	a widely held but false belief; a fictitious person or thing	a widely held but mistaken belief; somebody who or something that is fictitious or nonexistent, but whose existence is widely believed in	a commonly believed but false idea	a person or thing having only an imaginary or unverifiable existence	an invented or imaginary story, person, or thing; a story or belief, or body of stories or beliefs, that has no demonstrated basis in fact but is accepted as true without examination or investigation; a story, theme, or personage that may or may not be factual, preserved in oral or written form as an embodiment of a people's ideals and accepted truths	
<u>obloquy</u>	Abusively detractive language or utterance; calumny		a strongly condemnatory utterance; abusive language	statements that severely criticize or defame somebody	abuse or censure, esp. as directed at one by many or by the general public; calumny		strong public condemnation
<u>Obscure</u>	To conceal in obscurity; hide	conceal or make unclear	to make something unclear, indistinct, or hidden	to make something difficult to discover and understand	to conceal or hide by or as if by covering	to dim (perception) or conceal (something perceived); to make unclear in meaning	To conceal or hide by covering or intervening; To make obscure or unclear
<u>overdraw</u>	To spoil the effect of by exaggeration in telling or describing.		exaggerate; overstate	to exaggerate in describing or telling about something	to exaggerate the qualities of in a drawing, description, or the like		
<u>Pad</u>		defraud by adding false items to	inflate something by adding bogus expenses		to expand or increase especially with needless, misleading, or fraudulent matter		
<u>Palter</u>	To talk or act insincerely or misleadingly; equivocate	equivocate or prevaricate	to act or talk insincerely or deceitfully		to act insincerely or deceitfully	to speak or behave insincerely	
<u>Perjure</u>	To make (oneself) guilty of perjury by deliberately testifying falsely under oath.	commit perjury	to tell a lie in a court of law and therefore be guilty of perjury	to tell a lie in a law court, after promising formally to tell the truth	to make a perjurer of (oneself)	to render (oneself) guilty of perjury by giving false testimony under oath	To knowingly tell an untruth in a legal court and render oneself guilty of perjury.
<u>Perjury</u>	The deliberate, willful giving of false, misleading, or incomplete testimony under oath; The breach of an oath or promise	the offence of deliberately telling an untruth in court when under oath	the telling of a lie after having taken an oath to tell the truth, usually in a court of law; a lie told in a court of law by somebody who has taken an oath to tell the truth	the crime of telling lies in court when you have promised to tell the truth	the voluntary violation of an oath or vow either by swearing to what is untrue or by omission to do what has been promised under oath; false swearing	the intentional giving of false testimony under oath in a court or other official proceeding	Criminal offense of making false statements under oath

<u>Pervert</u>	To interpret incorrectly; misconstrue or distort	alter from an original meaning or state to a corruption of what was first intended	to misinterpret or distort something such as a piece of text	to change something so that it is not what it was or should be	to divert to a wrong end or purpose; to twist the meaning or sense of	to state or interpret incorrectly, esp. by intention; distort	To change the inherent purpose or function of something
<u>Phony</u>	Not genuine or real; counterfeit; False; spurious; Not honest or truthful; deceptive; Insincere or hypocritical; Giving a false impression of truth or authenticity; specious.		not genuine and used to deceive; putting on a false show of something such as sincerity or expertise; a phony person or thing; to make something appear to be genuine when it is not	not sincere or not real	not genuine or real; intended to deceive or mislead; intended to defraud; arousing suspicion; having no basis in fact; making a false show; counterfeit; fake;	not real or genuine; fake; someone or something that is not genuine; a fake; impostor	False; simulated
<u>Plant</u>	To place secretly or deceptively so as to be discovered or made public; To conceal; hide	a thing put among someone's belongings to incriminate or discredit them; put or hide (something) among someone's belongings as a plant	something dishonestly hidden to incriminate somebody; to put something secretly where it can be discovered later, e.g. by the police, in order to incriminate somebody	to put something or someone in a position secretly, especially in order to deceive someone; something illegal or stolen that has been put secretly in a person's clothing or among the things that belong to them to make them seem guilty of a crime	to covertly place for discovery, publication, or dissemination ;	a person or thing placed or used in such a manner as to deceive or entrap;	Something or someone used secretly for discovery by another
<u>play down</u>			to attach little importance to; minimize	to represent something as being less important or significant than it is		to obscure	
<u>Pose</u>	To represent oneself falsely; pretend to be other than what one is	pretend to be; a way of behaving adopted in order to impress or give a false impression	to pretend to be somebody or something else	to pretend to be something that you are not or to have qualities that you do not possess, in order to be admired or attract interest; when someone pretends to have qualities that they do not possess	to affect an attitude or character usually to deceive or impress	to pretend to be, or represent oneself as, what one is not; a false identity or affected manner	To pretend to be someone one is not; with fraudulent intentions
<u>Prevaricate</u>	To stray from or evade the truth; equivocate	avoid giving a direct answer when asked a question	to avoid giving a direct and honest answer or opinion, or a clear and truthful account of a situation, especially by quibbling or being	to avoid telling the truth or saying exactly what you think	to deviate from the truth; equivocate	to lie, mislead, or conceal the truth deliberately	To equivocate; To stray from the truth

			deliberately ambiguous or misleading				
<u>Profane</u>	To put to an improper, unworthy, or degrading use; abuse				to debase by a wrong, unworthy, or vulgar use	to use for improper or degrading purposes; abuse	To put to a wrong or unworthy use; to debase; to abuse; to defile.
<u>Profess</u>	To make a pretense of; pretend		to make a statement falsely claiming that something is the case	to claim something, sometimes in a way which is not sincere; describes a belief or feeling which someone claims to have or feel but which is probably not really held or felt	to declare in words or appearances only; pretend; claim	to claim or declare, esp. insincerely	To claim to be proficient
<u>propaganda</u>	The systematic propagation of a doctrine or cause or of information reflecting the views and interests of those advocating such a doctrine or cause.	information, ideas, opinions or images, often only giving one part of an argument, which are broadcast, published or in some other way spread with the intention of influencing people's opinions	the spreading of ideas, information, or rumor for the purpose of helping or injuring an institution, a cause, or a person; ideas, facts, or allegations spread deliberately to further one's cause or to damage an opposing cause	information put out by an organization or government to promote a policy, idea, or cause; deceptive or distorted information that is systematically spread	information, allegations, or opinions that are deliberately and methodically disseminated to promote or attack a particular doctrine, movement, nation, or the like.	Information that is spread for the purpose of promoting some cause	information, especially of a biased or misleading nature, used to promote a political cause or point of view
<u>Put On</u>	Pretended; feigned; A deceptive outward appearance; The act of teasing or misleading someone, especially for amusement; Something, such as a prank, intended as a hoax or joke; a spoof.		assumed or adopted for effect or in order to deceive; the act of intentionally deceiving or giving somebody the wrong impression, especially for humorous effect; an exterior appearance intended to deceive or mislead somebody	to try to deceive someone into believing something that is not true; when a person tries to deceive someone into believing something that is not true	Pretended; assumed; an instance of putting someone on	done or assumed deceptively; pretended; a deception done to amuse or tease; hoax;	
<u>Put up a front</u>							
<u>Queer</u>	Fake; counterfeit				worthless; counterfeit		

<u>Sell Down the River</u>					to deliver or give up in violation of duty, trust, or loyalty and especially for personal gain; to betray the faith of		
<u>Simulate</u>	To have or take on the appearance, form, or sound of; imitate; to make in imitation of or as a substitute for; To make a pretense of; feign	imitate or reproduce the appearance, character, or conditions of	to feign or pretend to experience something; to mimic or imitate somebody or something	to do or make something which looks real but is not real	to give or assume the appearance or effect of often with the intent to deceive	to imitate or reproduce the appearance, sound, or other external characteristics or qualities of; to put on an appearance of; pretend synonym: sham	To make a pretence of
<u>Slander</u>	Oral communication of false statements injurious to a person's reputation; A false and malicious statement or report about someone.	the action or crime of making a false spoken statement damaging to a person's reputation; a false and malicious spoken statement; make such statements about	the act or offense of saying something false or malicious that damages somebody's reputation; a false and malicious statement that damages somebody's reputation	a false spoken statement about someone which damages their reputation, or the making of such a statement; to damage someone's reputation by making a false spoken statement about them	the utterance of false charges or misrepresentations which defame and damage another's reputation; a false and defamatory oral statement about a person; to utter slander against	a false statement or statements intended to injure someone's reputation or well-being, or the act of making such statements; defamation; to utter damaging statements about; defame	Words falsely spoken that damage the reputation of another; To defame; to injure by maliciously propagating false rumors regarding a person's reputation; To bring discredit or shame upon by one's acts.
<u>slant</u>	To present so as to conform to a particular bias or appeal to a certain audience	to present information in a particular way, especially showing one group of people, one side of an argument, etc. in such a positive or negative way that it is unfair	to maliciously or dishonestly distort or falsify	to present something in a way that is biased toward a particular person, group, or viewpoint	to write or tell (a story or account) in a biased way; a bias, viewpoint, tone, or opinion that influences interpretation or presentation	A biased way of looking at or presenting something;	present or view (information) from a particular angle, especially in a biased or unfair way.

<u>Smear</u>	To stain or attempt to destroy the reputation of; vilify; A vilifying or slanderous remark	damage the reputation of (someone) by false accusations; a false or unwarranted accusation	to deliberately spread damaging rumors about somebody	an accusation which is unpleasant, unreasonable or unlikely to be true and which is made publicly with the intention of harming a person's reputation	to vilify especially by secretly and maliciously spreading grave charges and imputations	To damage the reputation or name of, esp. by unsubstantiated claims.	Slanderous defamation
<u>Smear</u>	To stain or attempt to destroy the reputation of; vilify; A vilifying or slanderous remark	damage the reputation of (someone) by false accusations; a false or unwarranted accusation	to deliberately spread damaging rumors about somebody; a damaging rumor about somebody	an accusation which is unpleasant, unreasonable or unlikely to be true and which is made publicly with the intention of harming a person's reputation	a usually unsubstantiated charge or accusation against a person or organization - often used attributively; to vilify especially by secretly and maliciously spreading grave charges and imputations	to damage the reputation or name of, esp. by unsubstantiated claims; a usually unfounded accusation or charge designed to damage someone's reputation; defamation	Slanderous defamation
<u>Snow</u>	To overwhelm with insincere talk, especially with flattery		to overwhelm or deceive somebody especially with flattery or charm	to deceive or trick someone by charming and persuasive talk or by giving them a lot of information	to deceive, persuade, or charm glibly	to deceive or persuade with insincere talk, esp. flattery	
<u>Soft-soap</u>	To flatter in order to gain something; cajole.	to try to persuade someone to do what you want by saying pleasant things to them (AL)	to soothe or persuade with flattery or blarney	to use flattery to persuade or distract somebody	informal, to cajole, flatter, or curry favor with	to persuade someone through flattery; to use flattering talk on somebody	hide or disguise one's true motives or feelings
<u>String Along</u>			to deceive or fool somebody over an extended period of time, especially by keeping him or her in a state of false hope		deceive; fool		
<u>subterfuge</u>	A deceptive stratagem or device	a trick or a dishonest way of achieving something	deception by artifice or stratagem in order to conceal, escape, or evade; a deceptive	a plan, action, or device designed to hide a real objective, or the process of hiding a real objective	a stratagem or artifice used to hide, avoid, or deceive	Something intended to misrepresent the true nature of an activity	a trick or deception used in order to achieve one's goal

			device or stratagem				
<u>Tale</u>	A deliberate lie; a falsehood; A narrative of real or imaginary events; a story.	a lie	a story or report that is untrue	a story, especially one which might be invented or difficult to believe	an intentionally untrue report	a falsehood; lie	An unbelievable story
<u>Tall Story</u>							
<u>twist</u>	A distortion of meaning	to change information so that it gives the message you want it to give, especially in a way that is dishonest	to alter the meaning of	to distort the meaning of something deliberately	to misconstrue the meaning of	To change the meaning of	
<u>Vilify</u>	To make vicious and defamatory statements about	speak or write about in an abusively disparaging manner	to make malicious and abusive statements about somebody	to say or write unpleasant things about someone or something, in order to cause other people to have a bad opinion of them	to utter slanderous and abusive statements against	to speak ill of; denounce; defame	To spread negative information about
<u>warp</u>	a distortion or twist.		distort	to make something deviate from its usual or correct course, or deviate from a usual or correct course	to distort (truth or fact)	To distort or turn from the true or natural course	
<u>white lie</u>	An often trivial, diplomatic or well-intentioned untruth.			a lie not intended to harm, but told in order to avoid distress or embarrassment	a small or harmless lie, often told to spare someone's feelings; well-intentioned fib		harmless lie told to avoid hurting someone's feelings
<u>whitewash</u>	To conceal or gloss over	to make something bad seem acceptable by hiding the truth	to gloss over or cover up (as vices or crimes)	a coordinated attempt to hide unpleasant facts, especially in a political context	the use of deceptive or misleading words or actions to gloss over or cover up faults, misdeeds, disgrace, or the like; to cover up or gloss over (a fault,	To cover up a misdemeanor	

					misdeed, or the like)		
<u>Whopper</u>	A gross untruth	a gross or blatant lie	a blatant and outrageous lie	a big lie	n extravagant or monstrous lie	a gross lie	A gross untruth
<u>wile</u>	A stratagem or trick intended to deceive or ensnare.		a trick or stratagem intended to ensnare or deceive	Cunning behavior intended to persuade somebody to do something, especially in the form of insincere charm or flattery		A trick or stragem practiced for ensnaring or deception; a sly, insidious artifice; a beguilement; an allurement. To draw or turn away, as by diversion	